FUTURE FISHERIES IMPROVEMENT PROGRAM GRANT APPLICATION

Please fill in the highlighted areas
all sections (IA, IB, IC, etc.) must be addressed or the application will be considered invalid

I. APPLICANT INFORMATION

A. Applicant Name: Big Blackfoot Chapter of Trout Unlimited

B. Mailing Address: PO Box 1

C. City: Ovando State: MT Zip: 59854

Telephone: 406-240-4824 E-mail: ryen@montanatu.org

D. Contact Person: Ryen Neudecker

Address if different from Applicant: See above

City: State: Zip:

Telephone: E-mail:

E. Landowner and/or Lessee Name (if other than Applicant): United States Forest Service-Shane Hendrickson, Fish Biologist

Mailing Address:

City: Missoula State: MT Zip:

Telephone: 406.362.3727 E-mail: shendrickson@fs.fed.us

II. PROJECT INFORMATION*

A. Project Name: Cottonwood Creek & North Fork Cottonwood Sediment Reduction

River, stream, or lake: Cottonwood Creek & North Fork Cottonwood Creek

Location: Township: 16N Range: 14W Section: 13
Latitude: 47.084857 Longitude: -113.184207 *within project (decimal degrees)*

County: Powell

B. Purpose of Project:

The purpose of this project is to restore fish passage, improve floodplain function, and reduce anthropogenic sediment inputs to Cottonwood Creek and North Fork Cottonwood by removing an undersized culvert and decommissioning approximately 1,600 feet of road adjacent to the stream. Cottonwood is a high priority, critical bull trout habitat stream that supports fluvial bull trout and genetically pure westslope cutthroat trout populations.

C. Brief Project Description:

North Fork Cottonwood Creek is a tributary to Cottonwood Creek which feeds the middle Blackfoot River and flows 16 miles entirely through USFS land before transitioning to a mix of state and private land through the lower 12 miles. Cottonwood Creek is a high priority tributary as ranked in "An Integrated Stream Restoration and Native Fish Conservation Strategy for 182 streams in the Blackfoot Basin" and is listed as critical bull trout habitat, a bull trout core area stream and supports populations of pure westslope cutthroat trout. Future Fisheries has been an important partner on several restoration projects in the Cottonwood Creek drainage including fish passage improvements, water conservation, stream restoration and fish screens. This project, which involves eliminating a chronic source of sediment to Cottonwood Creek and North Fork Cottonwood Creek has been identified as a priority under the ***Collaborative Forest Landscape Restoration Program***—a program identified in 2009 by the Secretary of Agriculture to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes.

The existing road segment that parallels Cottonwood Creek and crosses the North Fork of Cottonwood Creek immediately upstream of its confluence with the main stem is immediately adjacent to the main stem, precluding tree recruitment for habitat, floodplain capacity, shade, and increases in sediment delivery. At the crossing, the culvert is very undersized, requires chronic maintenance, and inhibits fish passage. This project proposes to reroute approximately 1,600 ft. of this road segment about 400 feet upstream from its present location. The effort would replace the existing culvert with a bottomless arch structure, which would properly accommodate flood capacity, fish passage, and transport of bedload and debris. Another large benefit would be decommissioning of the existing road segment, and thus reestablishing the historic floodplain along Cottonwood Creek. Overall, the effort on this segment is an exemplary example of how road access can be achieved with minimal to non-measurable aquatic impacts. And finally, collectively this work contributes to the cumulative projects that are holistically achieving benefits at a watershed scale of Cottonwood Creek.

The existing road system will be "ripped" 12 inches deep and 14 to 16 feet wide, meaning an excavator or dozer will de-compact the road surface, which will enhance infiltration and reduce runoff. The loosened surface and road fill impacting the stream channel and associated riparian areas will be pulled back to eliminate the road prism encroachment and used to recontour the slopes on the edge of the valley to a natural angle of repose or hauled off-site away from the riparian and floodplain area. Abandoned road surfaces will be also be reclaimed passively and actively. The newly loosened road surface enhances natural recolonization of vegetation, which in turn results in maintained infiltration capacity, protects against erosion and ultimately stabilizes the historic road prism. Large woody debris will also be incorporated onto the associated road surfaces and floodplains to create additional microsites to increase moisture retention, shelter young plants as they become established, and provide a source of organic material. Disturbed areas will be revegetated with a certified weed-free native streambank or appropriate upland grass seed mixture and soil amendments/erosion control will be applied as appropriate. Native cuttings, shrubs and trees will also be planted within riparian areas to facilitate shade and recruitment of woody debris when available. A noxious weed management plan will also be developed and implemented pre and post construction. To accommodate public access, 1,600 feet of new road will be constructed up on the terrace where it will no longer have such a negative impact to the Cottonwood Creek drainage.

Specific objectives include: improve fish passage, reestablish floodplain connectivity and function; restore the riparian corridor, eliminate a chronic source of sediment and allow for continued public access.

D. Length of stream or size of lake that will be treated: Close to a half mile of Cottonwood Creek and 1,000 feet of North Fork Cottonwood Creek will immediately benefit from this project, in addition to a reduction in sediment to downstream spawning and rearing reaches.

E. Project Budget:

Grant Request (Dollars): $ 36,500

Contribution by Applicant (Dollars): $ 5,000 In-kind $ 6,735

(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): $ 166,290 In-kind $

(attach verification - See page 2 budget template)

Total Project Cost: $ 214,525.00

F. Attach itemized (line item) budget – see template

G. Attach **specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support and fish biologist support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete a *supplemental questionnaire*** (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. **Attach land management & maintenance plans that will ensure protection of the reclaimed area**.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

Bull trout and westslope cutthroat trout.

B. How will the project protect or enhance wild fish habitat?:

Sediment has been identified as a limiting factor for bull trout and we have an opportunity to improve riparian habitat and water quality conditions in an important bull trout stream in the middle Blackfoot River. This project will also restore an important migratory corridor for westslope cutthroat trout.

C. Will the project improve fish populations and/or fishing? To what extent?:

Yes, by providing off-site recruitment to the Blackfoot River and angling opportunities on-site. Cottonwood Creek has numerous access sites.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

Yes, by increasing the quality of wild trout and spawning habitat in the Blackfoot River drainage. The public also has legal streamside access via adjacent USFS and State land.

E. The project agreement includes a 20-year maintenance commitment. Please discuss your ability to meet this commitment.

The USFS has committed to signing an appropriate version of a Landowner Agreement for a minimum of 20 years or a time period required by the Future Fisheries Program.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

Already answered above. By removing a stream-side road, we will improve water quality conditions and improve fish passage within the Cottonwood Creek drainage.

G. What public benefits will be realized from this project?:

This project involves the continuation of the Blackfoot River Restoration program and the restoration of a westslope cutthroat stream. Public benefits include: 1) expanding suitable habitat conditions for pure westslope cutthroat trout and fluvial juvenile bull trout populations, 2) improved water quality on-site and downstream, and 3) contribute to the recovery of westslope cutthroat trout. Additionally, the Bull Trout Conservation Strategy lists the Cottonwood Creek drainage as an important population that contributes to Blackfoot core bull trout population; the strategy identifies the main factor limiting recovery of bull trout as the lack of high quality tributaries throughout the watershed. This project, in conjunction with the cumulative effects of other projects in the drainage, will benefit bull trout and work towards stability and recovery of the core population, which is in the public's interest.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

This project will have no effect on water and property rights of adjacent landowners.

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No commercial recreational use is known to legally occur at this site.

J. Is this project associated with the reclamation of past mining activity?

No.

Each approved project applicant must enter into a written agreement with Montana Fish, Wildlife & Parks specifying terms and duration of the project. The applicant must obtain all applicable permits prior to project construction. A competitive bid process must be followed when using State funds.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:  Date: 05-25-2018

Sponsor (if applicable):

***Highlighted boxes will automatically expand.**

Mail To: Montana Fish, Wildlife & Parks
Fisheries Division
PO Box 200701
Helena, MT 59620-0701

E-mail To: Michelle McGree
mmcgree@mt.gov
(electronic submissions MUST be signed)

Incomplete or late applications will be rejected and returned to applicant.
Applications may be rejected if this form is modified.

*****Applications must be signed and *received* by the Future Fisheries Program Officer in Helena *before* December 1 and June 1 of each year to be considered for the subsequent funding period**.***

Photos 1-3: Existing culvert on North Fork Cottonwood Creek and road system encroaching on Cottonwood Creek

Cottonwood / NF Cottonwood passage & decommissioning

Revised September 6, 2017

Cottonwood / NF Cottonwood passage & decommissioning

Revised September 6, 2017

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS
(Revised 5/31/2018)

WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FISHERIES REQUEST	IN-KIND SERVICES	IN-KIND CASH	TOTAL
Personnel								
Survey	60	hours	$100.00	$ 6,000.00			$ 6,000.00	$ 6,000.00
Design	100	hours	$100.00	$ 10,000.00			$ 10,000.00	$ 10,000.00
Staking	50	hours	$100.00	$ 5,000.00			$ 5,000.00	$ 5,000.00
Permitting	20	hours	$45.00	$ 900.00		$900		$ 900.00
Oversight	90	hours	$100.00	$ 9,000.00		4,000.00	5,000.00	$ 9,000.00
Labor	80	hours	$45.00	$ 3,600.00			3,600.00	$ 3,600.00
				$ 34,500.00				$ 34,500.00
Travel								
Mileage	2000	miles	$0.58	$ 1,160.00		1,160.00		$ 1,160.00
Per diem	15	days	$45.00	$ 675.00		675.00		$ 675.00
				$ 1,835.00				$ 1,835.00
Construction Materials****								
Clearning & Grubbing	LS	Each	$6,000.00	$ 6,000.00	-		$6,000	$ 6,000.00
Soil erosion & Pollution Control	LS	each	$8,000.00	$ 8,000.00	-		$8,000	$ 8,000.00
Removal of culvert	LS	each	$2,750.00	$ 2,750.00	1,000.00		$1,750	$ 2,750.00
Roadway Excavation	CY	1938	$30.00	$ 58,140.00			58,140.00	$ 58,140.00
Structural Backfill	CY	307	$40.00	$ 12,280.00	4,000.00		8,280.00	$ 12,280.00
Structure Excavation	LS	eacg	$8,500.00	$ 8,500.00	2,000.00		6,500.00	$ 8,500.00
Placed Rip-Rap	CY	11	$100.00	$ 1,100.00			1,100.00	$ 1,100.00
Geocell Abutment Stabilization	Sq Yd	54	$75.00	$ 4,050.00	1,000.00		3,050.00	$ 4,050.00
Road Decomm	LS	each	$7,000.00	$ 7,000.00	$5,000.00		2,000.00	$ 7,000.00
Aggregate Surface Course	CY	60	$35.00	$ 2,100.00			2,100.00	$ 2,100.00
Precast Stem Wall w/footing	LF	1	$22,500.00	$ 22,500.00	5,500.00		17,000.00	$ 22,500.00
18" Culvert	LF	48	$50.00	$ 2,400.00			2,400.00	$ 2,400.00
24" Culvert	LF	36	$60.00	$ 2,160.00			2,160.00	$ 2,160.00
Structural Plate Arch 12'x5'	LF	46	$360.00	$ 16,560.00	$10,000.00		6,560.00	$ 16,560.00

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS
(Revised 5/31/2018)

Seeding, Reveg & Dry Mulch	LS	each		$4,000.00	$ 4,000.00	2,000.00		2,000.00	$	4,000.00
Placed Streambed Rock	CY	45		$50.00	$ 2,250.00	1,000.00		1,250.00	$	2,250.00
Rock Cross-Vane	Each	9		$600.00	$ 5,400.00	2,500.00		2,900.00	$	5,400.00
Log Cross-Vane	Each	5		$600.00	$ 3,000.00	1,500.00		1,500.00	$	3,000.00
					$ 168,190.00				$	168,190.00
Mobilization										
Mob/demob	1	lump sum		$10,000.00	$ 10,000.00	1,000.00		9,000.00	$	10,000.00
				TOTALS	$ 214,525.00	$ 36,500.00	$ 6,735.00	$ 171,290.00	$	214,525.00

MATCHING CONTRIBUTIONS

CONTRIBUTOR	IN-KIND SERVICE	IN-KIND CASH	TOTAL	Secured? (Y/N)
US Forest Service	$ -		$ 166,290.00	YES
Big Blackfoot Chapter of Trout Unlimited	$ 6,735.00	$ 5,000.00	$ 11,735.00	YES

United States Department of Agriculture | Forest Service | Lolo National Forest | Building 24, Fort Missoula
Missoula, MT 59804-7297
406 329-3750

May 29, 2018

Montana Fish Wildlife & Parks
Future Fisheries Habitat Improvement Program
P.O. Box 200701
Helena, MT 59620-0701

RE: N. Fk. Cottonwood Creek AOP and Road Reroute

Dear Michelle and Members of the Citizen Panel:

The Lolo National Forest has been working with The Big Blackfoot Chapter of Trout Unlimited, BBCTU, and Montana Fish, Wildlife and Parks in a comprehensive effort to improve fisheries conditions in the Blackfoot drainage for nearly two decades. Efforts have primarily focused on remediating historic stream alterations, improving native fish habitat, restoring connectivity, and addressing infrastructure issues such as reducing the multi-fold impacts of problematic roads. One of the current projects that I highly support is the N. Fk. Cottonwood Creek AOP and U.S. Forest Service, USFS, Road No. 477 Reroute project. The North Fork of Cottonwood Creek supports a native fish assemblage of resident bull trout and westslope cutthroat trout populations and is tributary to main Cottonwood Creek, also an important fishery in the Blackfoot system. Road No. 477 has had both historic and current negative influences on both Cottonwood and N. Fk. of Cottonwood Creeks.

Spanning across the foothills between Seeley Lake and the North Fork of the Blackfoot watershed, Road No. 477 closely parallels Cottonwood Creek in several locations and crosses many tributaries. At the proposed project location, Road No. 477 is immediately adjacent to the main stem, precluding tree recruitment for habitat, floodplain capacity, shade, and increases in sediment delivery. At the North Fork crossing, the culvert is very undersized, requires chronic maintenance, and inhibits fish passage. The project proposes to reroute approximately 1600 ft. of this road segment about 400 feet upstream from its present location. The effort would replace the existing culvert with a bottomless arch structure, which would properly accommodate flood capacity, fish passage, and transport of bedload and debris. Another large benefit would be decommissioning of the existing road segment, and thus reestablishing the historic floodplain along at least 400 feet of Cottonwood Creek.

Overall, the effort on this segment is an exemplary example of how road access can be achieved with minimal to non-measureable aquatic impacts and collectively contributes to the cumulative projects that are holistically achieving benefits at a watershed scale of Cottonwood Creek.

Thank you for your consideration in supporting this proposed project. If you have questions about the elements of this project that benefits native fisheries resources in the Blackfoot River drainage, please contact Ryen Neudecker of BBCTU at 406.240.4824, or myself at 406.329/3896.

Sincerely,

/s/ Traci Sylte

Traci L. Sylte, PE
Water, Soils, and Fisheries Program Manager
Lolo National Forest

GOVERNMENT FURNISHED

- ROADWAY EMBANKMENT SOURCE
- SLASH FILTER WINDROW SOURCE
- STREAMBED SIMULATION MATERIAL SOURCE
- WASTE SITE

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION ONE

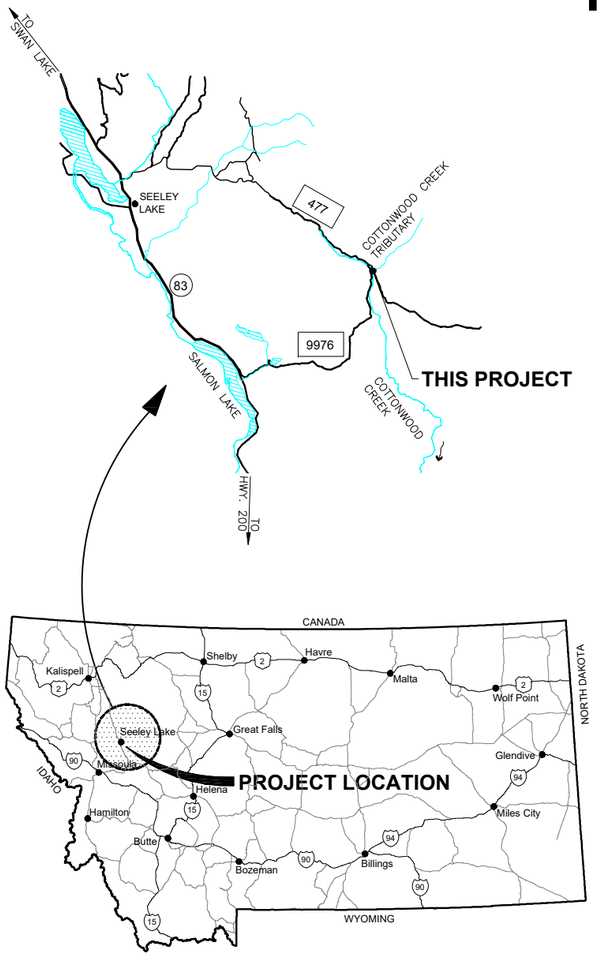
CONSTRUCTION PLANS FOR

COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5

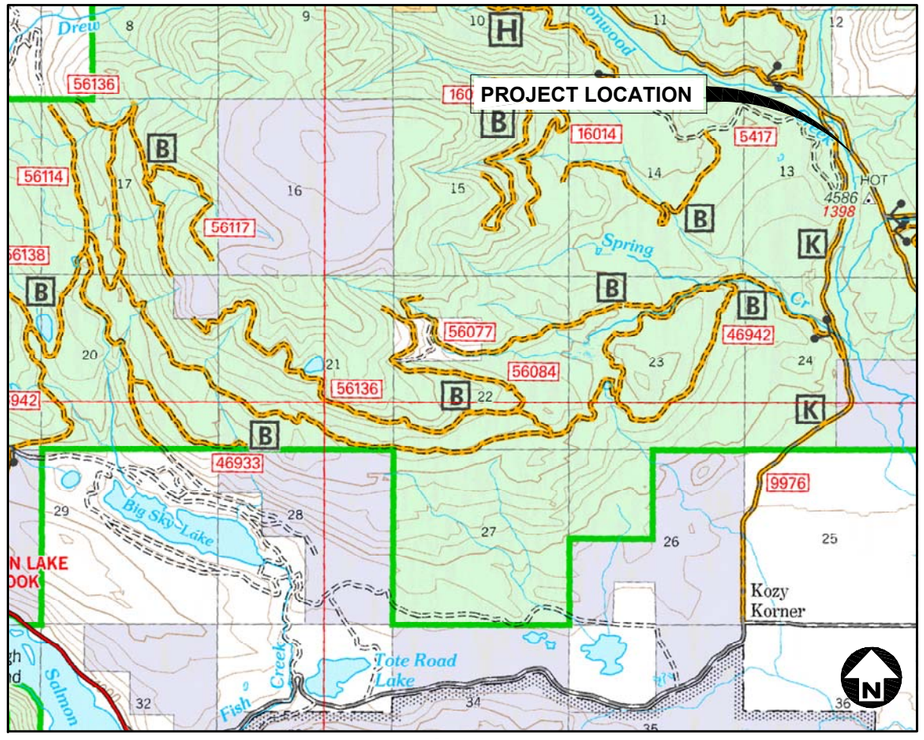
LOLO NATIONAL FOREST
SEELEY LAKE RANGER DISTRICT
MISSOULA COUNTY, MONTANA

50% SUBMITTAL

SECTION 13, TOWNSHIP 16 NORTH, AND RANGE 14 WEST



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

SHEET INDEX

PROJECT: 1-17327
DATE: APRIL 26, 2018

APPROVED:

FOREST SUPERVISOR
LOLO NATIONAL FOREST DATE

APPROVED:

FOREST ENGINEER
LOLO NATIONAL FOREST DATE

RECOMMENDED:

SEELEY LAKE DISTRICT RANGER
LOLO NATIONAL FOREST DATE

PLANS PREPARED BY:

JUSTIN EVERTZ, E.I.

APPROVED BY:

--

QA/QC BY:

--

DRAFT
MONTANA
JEREMIAH (JAMES) HEYS JR.
PROFESSIONAL ENGINEER
LICENSED P.E.

NOTE:
DRAWING SCALE IS ONLY ACCURATE WHEN PLANS ARE PLOTTED ON 11" X 17" (TABLOID)-SIZED PAPER.

GreatWest engineering ®
2501 BELT VIEW DRIVE
HELENA, MT 59601
(406)449-8627

NO.	REVISION DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			
6			

SET NO.

SHEET NO. 1

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-1-Cover1.dwg

GENERAL NOTES:

SPECIFICATIONS:
MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14 (U.S. CUSTOMARY UNITS) AND MODIFIED BY THE FOREST SERVICE SUPPLEMENTAL SPECIFICATIONS (FSSS's).

DESIGN SPECIFICATION:
DESIGNS SHALL CONFORM TO HL-93 LOADING IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, CURRENT EDITION WITH CURRENT INTERIMS.

HYDROLOGY & HYDRAULICS:
THE STRUCTURE WAS DESIGNED TO PASS THE 100-YEAR FLOOD EVENT OF 57.7 CFS WITH A MINIMUM OF TWO FEET OF FREEBOARD. FOR THIS SITE, THE 2-YEAR AND THE 10-YEAR EVENTS WERE ESTIMATED AT 12.7 CFS AND 28.9 CFS, RESPECTIVELY.

STRUCTURAL PLATE ARCH:
THE STRUCTURAL PLATE ARCH SHALL BE 12'-0" SPAN, 5'-0" RISE, 6" X 2" CORRUGATIONS WITH GALVANIZED STEEL PLATE OF 0.110" THICKNESS.

THESE PLATES SHALL BE CONNECTED WITH BOLTS SUPPLIED BY THE MANUFACTURER.

THE CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS AND CONDITIONS PRIOR TO ORDERING MATERIALS.

THE STRUCTURAL PLATE ARCH CULVERT SHALL BE ASSEMBLED IN ACCORDANCE WITH THE PLATE LAYOUT DRAWINGS PROVIDED BY THE MANUFACTURER AND PER THE MANUFACTURER'S RECOMMENDATIONS.

CONCRETE:
USE CLASS A(AE) OR C(AE) CONCRETE, F'c = 4,000 PSI AT 28 DAYS WITH AN ENTRAINED AIR CONTENT OF 5% ± 1%. FINISH CONCRETE WITH A CLASS 1 - ORDINARY SURFACE FINISH.

ALL CONCRETE SHALL BE MADE IN ACCORDANCE WITH AN APPROVED MIX DESIGN. CHAMFER ALL EXPOSED EDGES OF CONCRETE AND FILLET ALL RE-ENTRANT ANGLES ¾" UNLESS NOTED OTHERWISE.

REINFORCING STEEL:
ALL REINFORCING SHALL BE OF THE DEFORMED BAR TYPE CONFORMING TO AASHTO M31 (ASTM A615), GRADE 60. CONCRETE CLEAR COVER SHALL BE 2" UNLESS SHOWN OTHERWISE ON THE PLANS. BENDING AND SPLICING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 315.

HARDWARE AND STRUCTURAL STEEL:
ALL STEEL SHAPES, PLATES AND BARS SHALL CONFORM TO AASHTO M270 (ASTM A36) AND SHALL BE GALVANIZED. HARDWARE SHALL MEET REQUIREMENTS OF ASTM A325 UNLESS SHOWN OTHERWISE ON THE PLANS. ALL WELDING TO BE CONDUCTED BY A CERTIFIED WELDER WITH CREDENTIALS SUBMITTAL REQUIRED. ALL WELDING SHALL BE IN ACCORDANCE WITH AWS D1.5, BRIDGE WELDING CODE. ALL ELECTRODES SHALL BE E70XX.

EROSION CONTROL:
SUBMIT AN EROSION CONTROL PLAN TO THE C.O. FOR REVIEW PRIOR TO BEGINNING ANY WORK. PROVIDE METHODS TO PREVENT RUNOFF FROM THE CONSTRUCTION SITE FROM DIRECTLY ENTERING INTO LIVE STREAMS.

SEEDING AND MULCH:
SEEDING IS REQUIRED ON ALL NEW ROAD CONSTRUCTION SLOPES AND IN ALL AREAS OF DISTURBANCE.

SEEDING IS ALSO REQUIRED ON AREAS OF CHANNEL EXCAVATION AND EMBANKMENT ABOVE THE BANKFULL ELEVATION. PLACE STRAW MULCH (WEED FREE CERTIFIED) IN ALL SEEDED AREAS AS DIRECTED BY C.O. THIS WORK IS PAID UNDER ITEM 62504. SEEDING OF THE OBLITERATED ROADWAY DISTURBANCE AREA SHALL BE PAID UNDER ITEM 62504. APPLY SEED AND MULCH PER FSSS 625. MULCH 100' ON BOTH SIDES OF THE CULVERT REMOVAL ON THE OBLITERATED ROADWAY

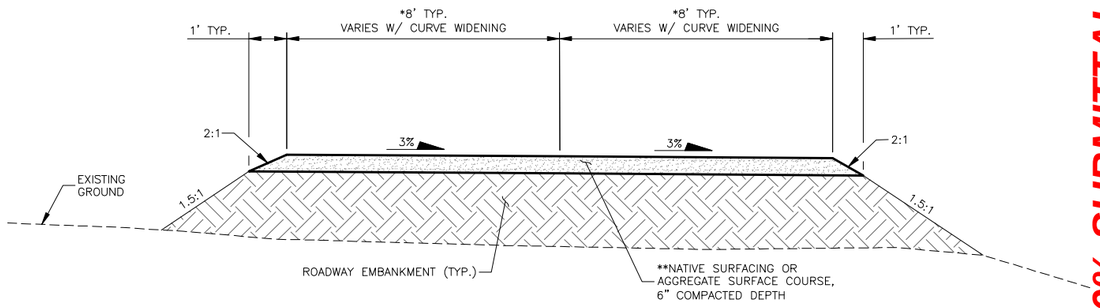
ROADWAY SURFACING:
LOCATIONS TO PLACE NATIVE SURFACING AND AGGREGATE SURFACE COURSE ARE SHOWN ON SHEET 3. NATIVE SURFACING SHALL CONSIST OF EMBANKMENT MATERIAL SORTED TO 1½"-MINUS MATERIAL COMPACTED TO THE DEPTH SHOWN ON THE TYPICAL SECTIONS.

NATIVE SURFACING SHALL BE PAID UNDER ITEM 20407.
AGGREGATE SURFACE COURSE SHALL BE PAID UNDER ITEM 30207.

CLEARING & GRUBBING:
TOPS, LIMBS, & SLASH: CONTRACTOR SHALL SALVAGE ALL APPROPRIATELY SIZED TOPS, LIMPS AND SLASH FROM CLEARING & GRUBBING TO BE SCATTERED AND USED FOR SLASH FILTER WINDROWS.

STUMPS: CONTRACTOR WILL BE ALLOWED TO REMOVE, CHIP, OR BURY STUMPS RESULTING FROM CLEARING AND GRUBBING. IF THE CONTRACTOR ELECTS TO BURY STUMPS, REQUIREMENTS FROM FSSS 203 SHALL BE FOLLOWED.

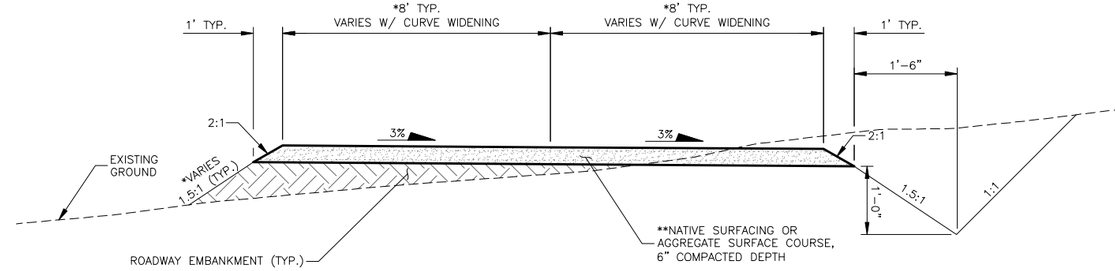
MERCHANTABLE TIMBER: ALL MERCHANTABLE TIMBER THAT IS CUT DURING CLEARING AND GRUBBING SHALL BE NEATLY AND ORDERLY DECKED NEAR THE PROJECT SITE AS SPECIFIED BY THE C.O.



*SEE ROADWAY CROSS-SECTIONS ON SHEETS 15-18
**NATIVE SURFACING STA. 0+70.00 TO STA. 5+37.00 AND STA. 7+37.00 TO STA. 16+70.00 (SEE GENERAL NOTES THIS SHEET)
**AGGREGATE SURFACE COURSE STA. 5+37.00 TO STA. 7+37.00

TYPICAL FILL ROADWAY SECTION

NOT TO SCALE



*SEE ROADWAY CROSS-SECTIONS ON SHEETS 15-18
**NATIVE SURFACING STA. 0+70.00 TO STA. 5+37.00 AND STA. 7+37.00 TO STA. 16+70.00 (SEE GENERAL NOTES THIS SHEET)
**AGGREGATE SURFACE COURSE STA. 5+37.00 TO STA. 7+37.00

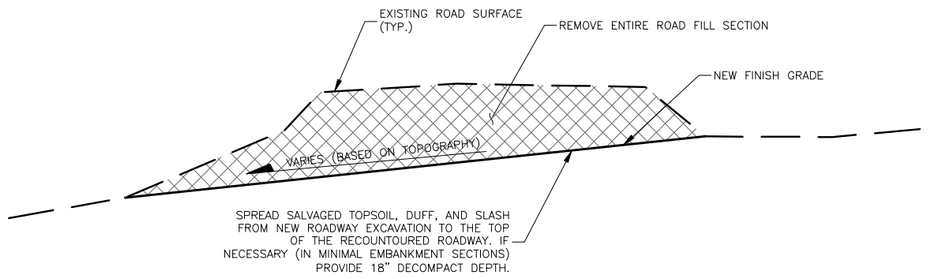
TYPICAL CUT ROADWAY SECTION

NOT TO SCALE

ESTIMATED QUANTITIES*

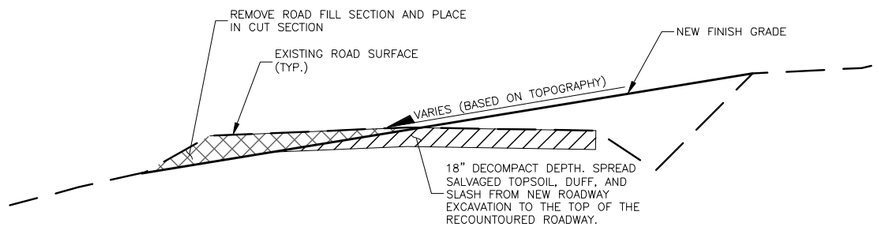
ITEM NO.	DESCRIPTION	METHOD OF MEASUREMENT	UNIT	QUANTITY
15101	MOBILIZATION	LSQ	LS	1
15201	CONSTRUCTION STAKING, METHOD 2, TOLERANCE CLASS B	LSQ	LS	1
15713	SOIL EROSION AND POLLUTION CONTROL	LSQ	LS	1
20101	CLEARING AND GRUBBING	LSQ	LS	1
20301	REMOVAL OF EXISTING CULVERT, REMOVAL METHOD A	LSQ	LS	1
20407	ROADWAY EXCAVATION	CQ	CY	1938
20803	STRUCTURAL BACKFILL	CQ	CY	307
20804	STRUCTURE EXCAVATION	LSQ	LS	1
21102	ROADWAY OBLITERATION, METHOD 1	LSQ	LS	1
25101	PLACED RIPRAP, CLASS 4	CQ	CY	11
27250	GEOCELL ABUTMENT STABILIZATION, 6-INCH DEPTH	CQ	SY	54
30207	AGGREGATE SURFACE COURSE, COMPACTION METHOD 2 (COMMERCIAL SOURCE)	CQ	CY	60
553A01	PRECAST CONCRETE MEMBER, STEM WALL W/ FOOTING	LSQ	LS	1
60201a	18 INCH PIPE CULVERT, STEEL	CQ	LF	48
60201b	24 INCH PIPE CULVERT, STEEL	CQ	LF	36
60302	12' - 0" SPAN, 5' - 0" RISE, STRUCTURAL PLATE ARCH, 0.111" THICK, 6" X 2" CORRUGATIONS	CQ	LF	46
62201a	HYDRAULIC EXCAVATOR WITH THUMB	AQ	HR	16
62201b	LARGE DUMP TRUCK	AQ	HR	8
62504	SEEDING & MULCHING, DRY METHOD	CQ	ACRE	0.56
64801	PLACED STREAMBED SIMULATION ROCK, BED CLASS 8, METHOD A (GOV'T FURNISHED SOURCE)	CQ	CY	20
64808a	ROCK CROSS-VANE STRUCTURE	AQ	EA	9
64808b	LOG CROSS-VANE STRUCTURE	AQ	EA	5
67050	SLASH FILTER WINDROW (GOV'T FURNISHED SOURCE)	AQ	LF	198

INFORMATIONAL ONLY - NOT FOR BIDDING PURPOSES - REFER TO BID SCHEDULE



OBLITERATION DETAIL, METHOD 1 - EMBANKMENT SECTION

FULL RECONTOUR



OBLITERATION DETAIL, METHOD 1 - CUT SECTION

FULL RECONTOUR

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

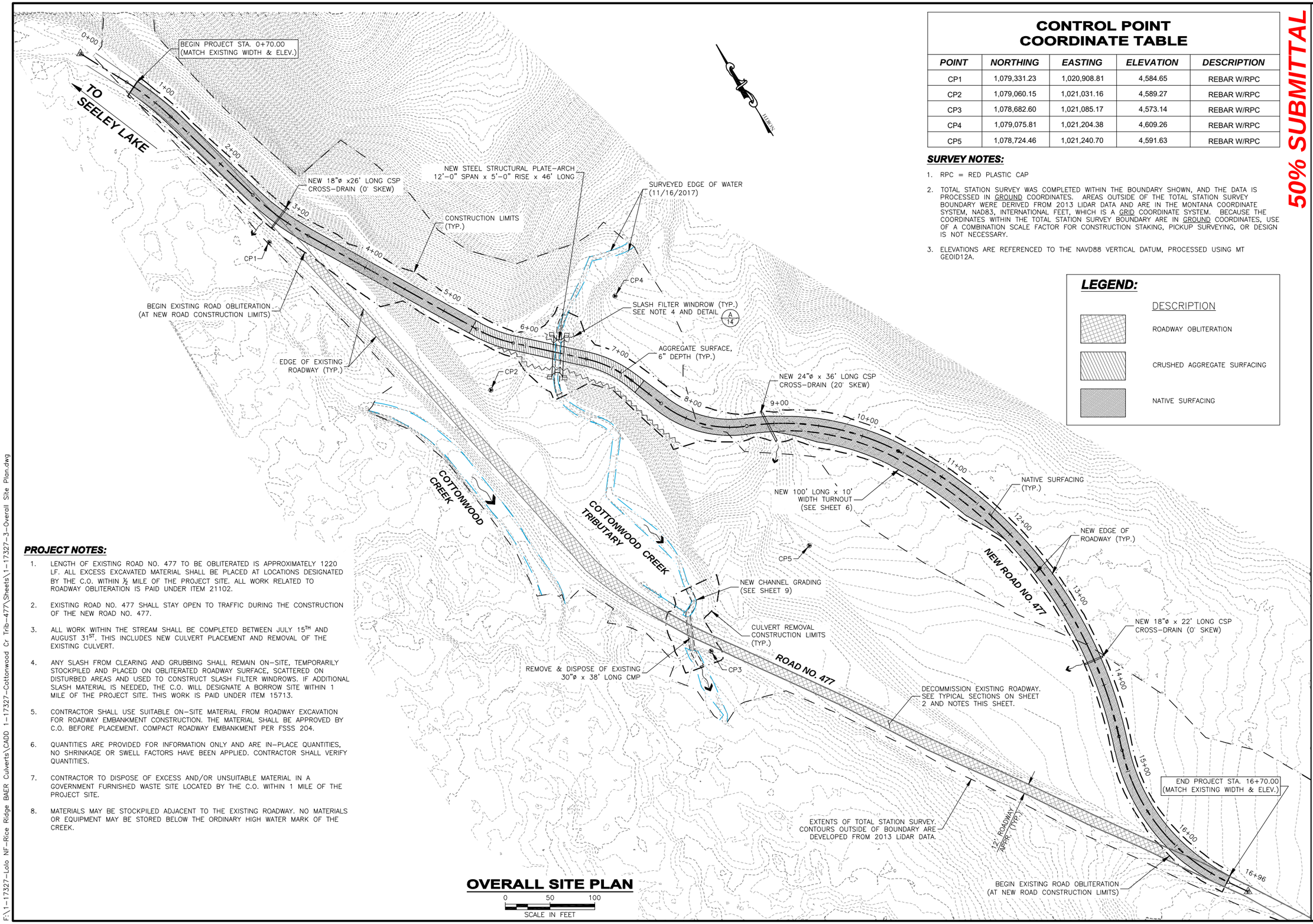
FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE — REGION ONE

GreatWest engineering®
2501 BELT VIEW DRIVE
HELENA, MT 59601
(406)449-8627

LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5
TYPICAL ROADWAY SECTIONS & GENERAL NOTES

SHEET NO.
2
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-2-Notes&TypSect.dwg



OVERALL SITE PLAN

0 50 100

SCALE IN FEET

CONTROL POINT COORDINATE TABLE

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	1,079,331.23	1,020,908.81	4,584.65	REBAR W/RPC
CP2	1,079,060.15	1,021,031.16	4,589.27	REBAR W/RPC
CP3	1,078,682.60	1,021,085.17	4,573.14	REBAR W/RPC
CP4	1,079,075.81	1,021,204.38	4,609.26	REBAR W/RPC
CP5	1,078,724.46	1,021,240.70	4,591.63	REBAR W/RPC

SURVEY NOTES:

1. RPC = RED PLASTIC CAP
2. TOTAL STATION SURVEY WAS COMPLETED WITHIN THE BOUNDARY SHOWN, AND THE DATA IS PROCESSED IN GROUND COORDINATES. AREAS OUTSIDE OF THE TOTAL STATION SURVEY BOUNDARY WERE DERIVED FROM 2013 LIDAR DATA AND ARE IN THE MONTANA COORDINATE SYSTEM, NAD83, INTERNATIONAL FEET, WHICH IS A GRID COORDINATE SYSTEM. BECAUSE THE COORDINATES WITHIN THE TOTAL STATION SURVEY BOUNDARY ARE IN GROUND COORDINATES, USE OF A COMBINATION SCALE FACTOR FOR CONSTRUCTION STAKING, PICKUP SURVEYING, OR DESIGN IS NOT NECESSARY.
3. ELEVATIONS ARE REFERENCED TO THE NAVD88 VERTICAL DATUM, PROCESSED USING MT GEOID12A.

LEGEND:

DESCRIPTION

- ROADWAY OBLITERATION
- CRUSHED AGGREGATE SURFACING
- NATIVE SURFACING

PROJECT NOTES:

1. LENGTH OF EXISTING ROAD NO. 477 TO BE OBLITERATED IS APPROXIMATELY 1220 LF. ALL EXCESS EXCAVATED MATERIAL SHALL BE PLACED AT LOCATIONS DESIGNATED BY THE C.O. WITHIN ½ MILE OF THE PROJECT SITE. ALL WORK RELATED TO ROADWAY OBLITERATION IS PAID UNDER ITEM 21102.
2. EXISTING ROAD NO. 477 SHALL STAY OPEN TO TRAFFIC DURING THE CONSTRUCTION OF THE NEW ROAD NO. 477.
3. ALL WORK WITHIN THE STREAM SHALL BE COMPLETED BETWEEN JULY 15TH AND AUGUST 31ST. THIS INCLUDES NEW CULVERT PLACEMENT AND REMOVAL OF THE EXISTING CULVERT.
4. ANY SLASH FROM CLEARING AND GRUBBING SHALL REMAIN ON-SITE, TEMPORARILY STOCKPILED AND PLACED ON OBLITERATED ROADWAY SURFACE, SCATTERED ON DISTURBED AREAS AND USED TO CONSTRUCT SLASH FILTER WINDROWS. IF ADDITIONAL SLASH MATERIAL IS NEEDED, THE C.O. WILL DESIGNATE A BORROW SITE WITHIN 1 MILE OF THE PROJECT SITE. THIS WORK IS PAID UNDER ITEM 15713.
5. CONTRACTOR SHALL USE SUITABLE ON-SITE MATERIAL FROM ROADWAY EXCAVATION FOR ROADWAY EMBANKMENT CONSTRUCTION. THE MATERIAL SHALL BE APPROVED BY C.O. BEFORE PLACEMENT. COMPACT ROADWAY EMBANKMENT PER FSSS 204.
6. QUANTITIES ARE PROVIDED FOR INFORMATION ONLY AND ARE IN-PLACE QUANTITIES, NO SHRINKAGE OR SWELL FACTORS HAVE BEEN APPLIED. CONTRACTOR SHALL VERIFY QUANTITIES.
7. CONTRACTOR TO DISPOSE OF EXCESS AND/OR UNSUITABLE MATERIAL IN A GOVERNMENT FURNISHED WASTE SITE LOCATED BY THE C.O. WITHIN 1 MILE OF THE PROJECT SITE.
8. MATERIALS MAY BE STOCKPILED ADJACENT TO THE EXISTING ROADWAY. NO MATERIALS OR EQUIPMENT MAY BE STORED BELOW THE ORDINARY HIGH WATER MARK OF THE CREEK.

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
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DATE: APRIL 26, 2018

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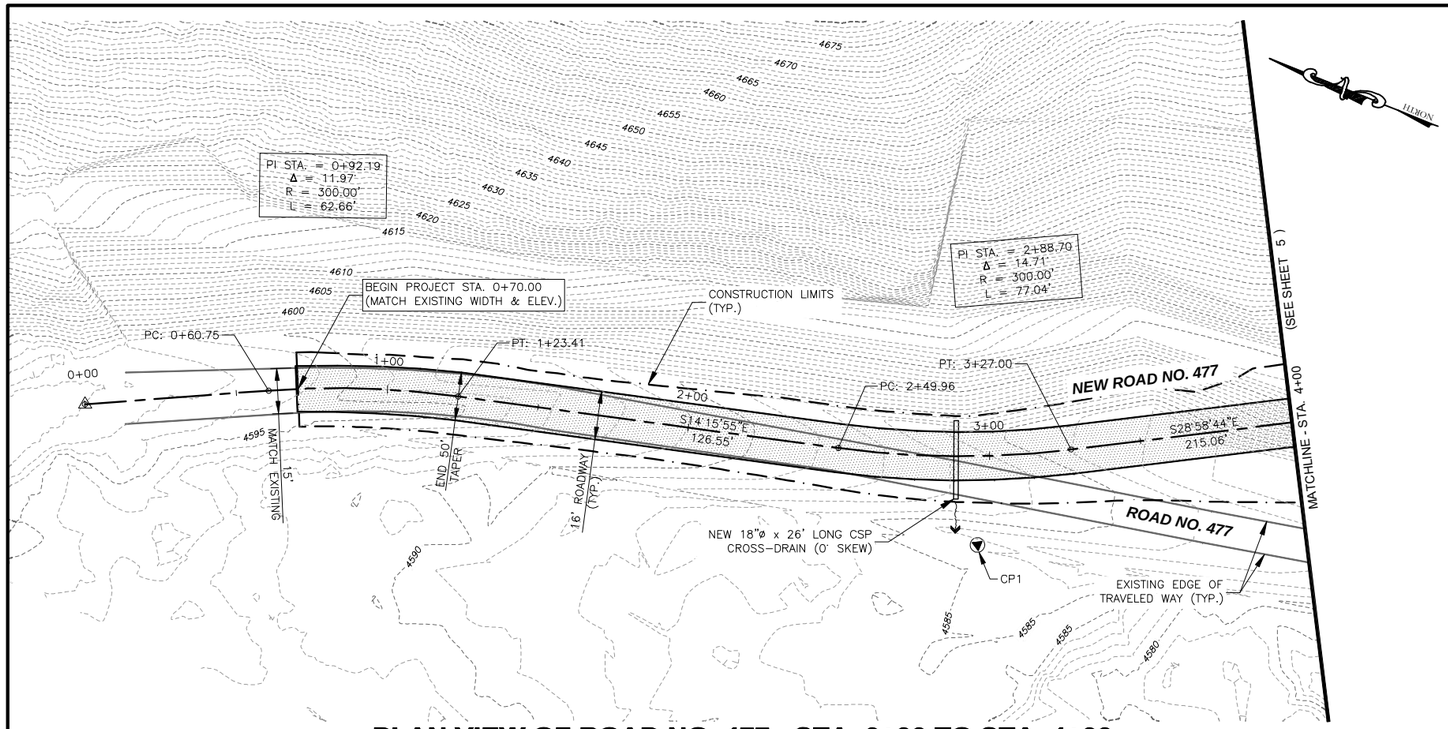
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5
OVERALL SITE PLAN

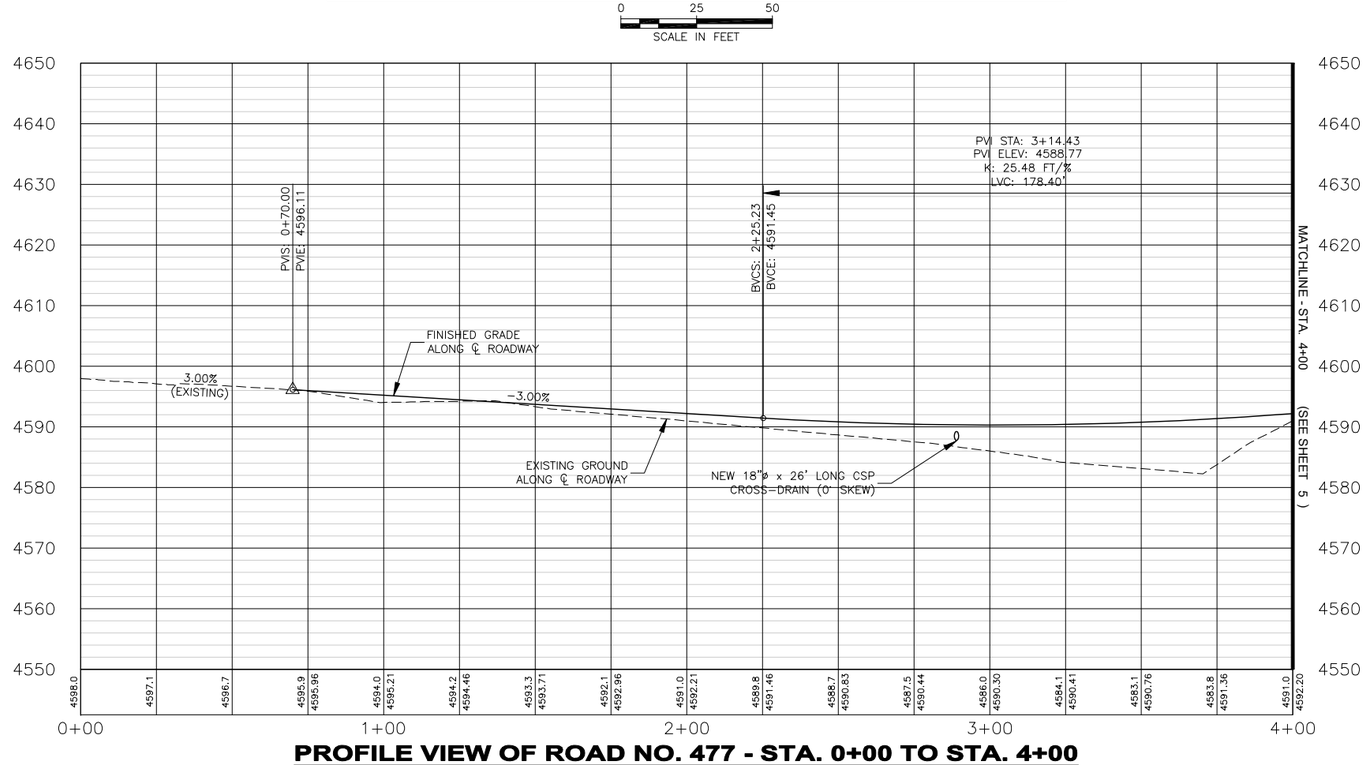
SHEET NO. 3 OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-3-Overall Site Plan.dwg



PLAN VIEW OF ROAD NO. 477 - STA. 0+00 TO STA. 4+00

0 25 50
SCALE IN FEET



PROFILE VIEW OF ROAD NO. 477 - STA. 0+00 TO STA. 4+00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
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DATE: APRIL 26, 2018

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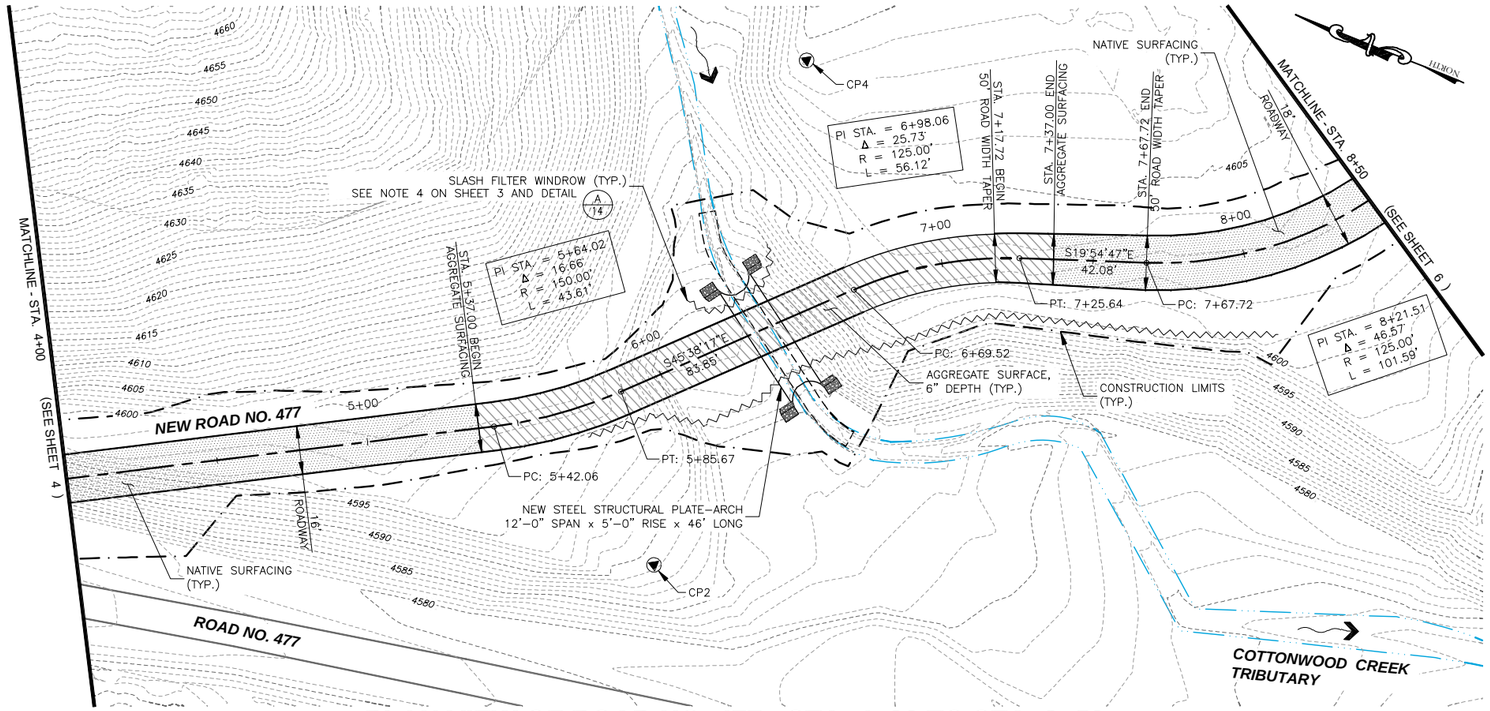
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROAD PLAN & PROFILE - STA. 0+00 TO STA. 4+00

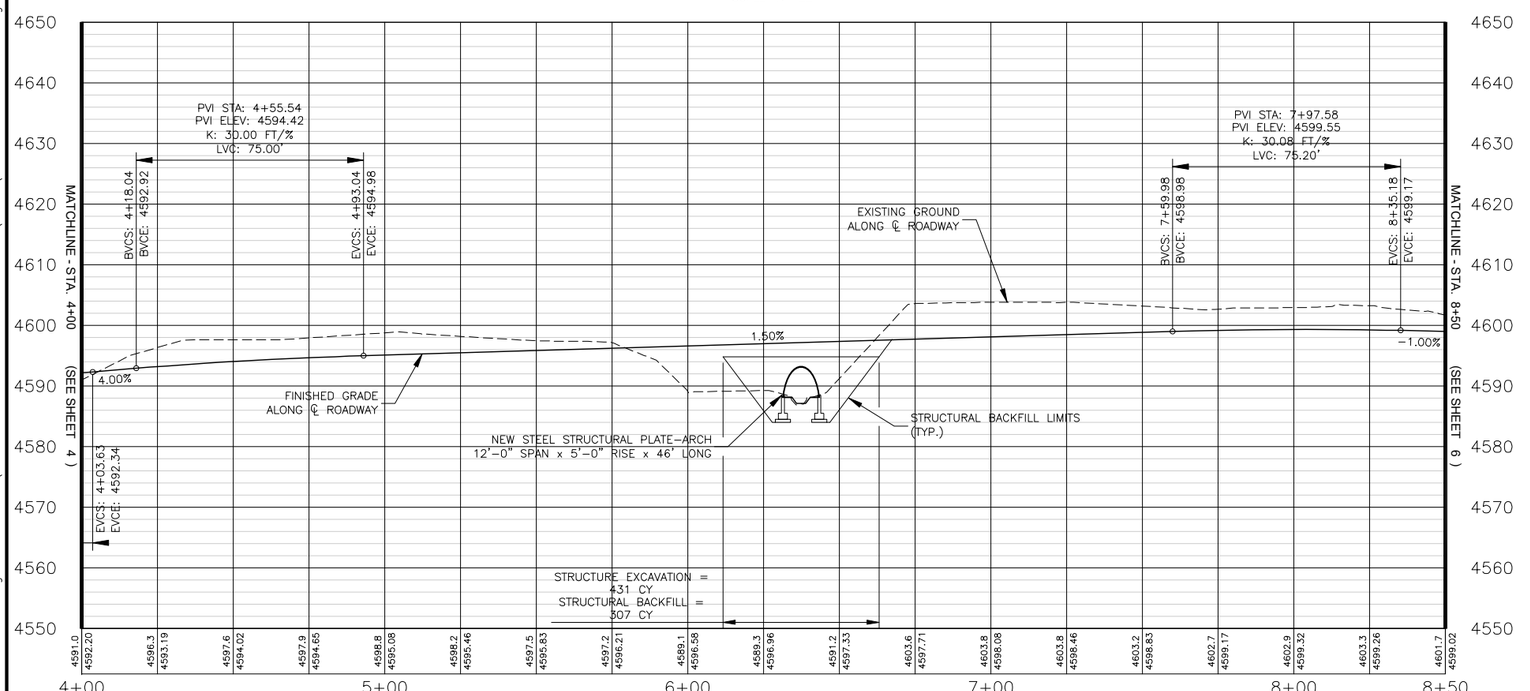
SHEET NO.
4
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-4-Road P&P1.dwg



PLAN VIEW OF ROAD NO. 477 - STA. 4+00 TO STA. 8+50

SCALE IN FEET



PROFILE VIEW OF ROAD NO. 477 - STA. 4+00 TO STA. 8+50

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
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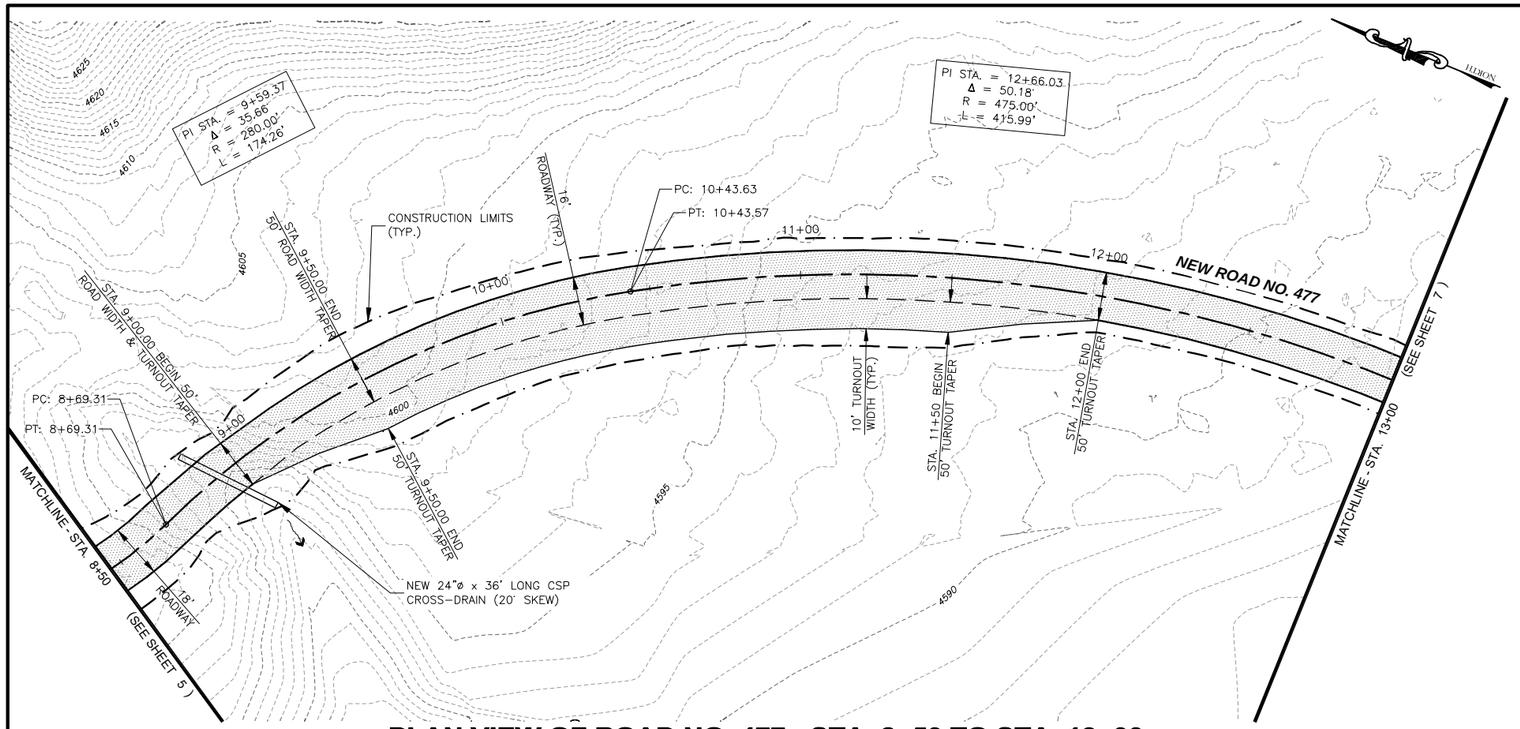
ROAD NO. 477 - M.P. - 10.5
ROAD PLAN & PROFILE - STA. 4+00 TO STA. 8+50

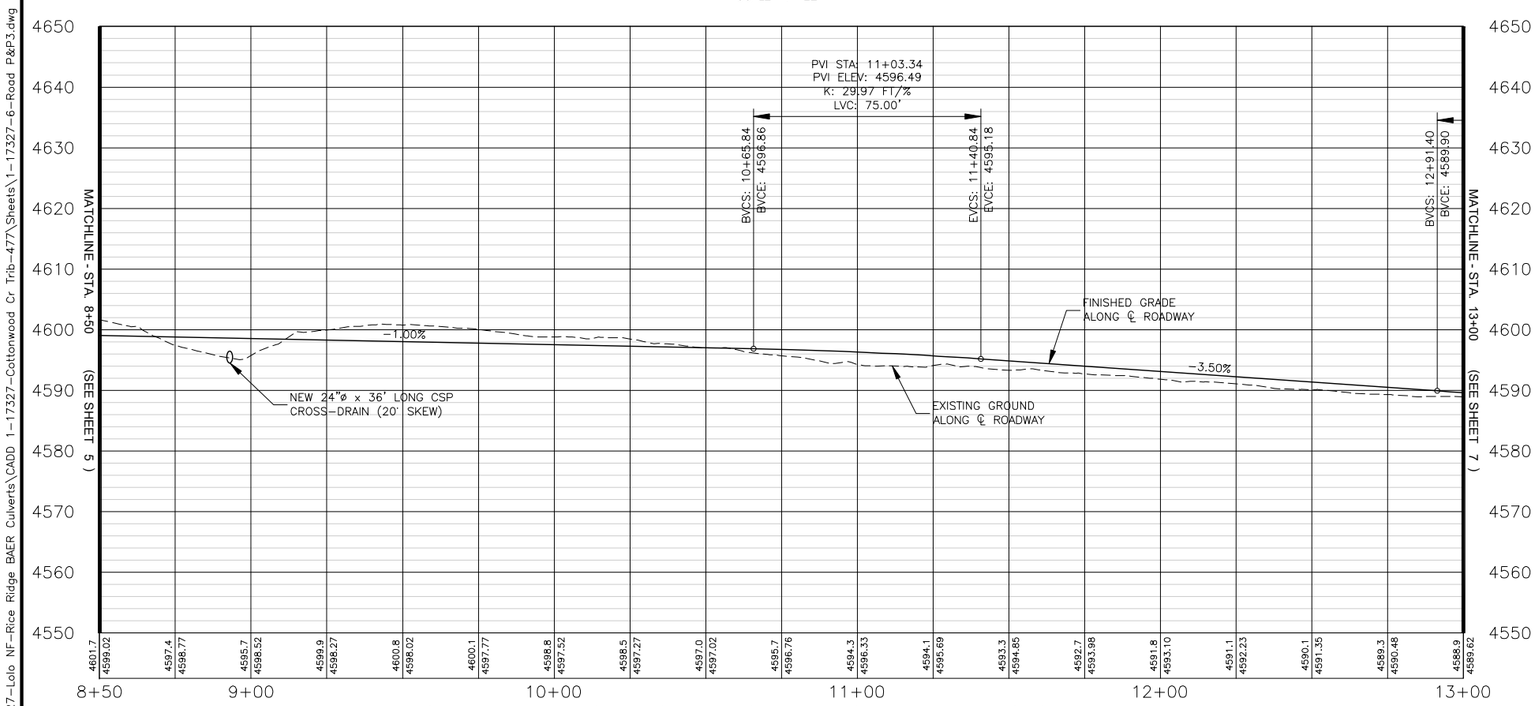
SHEET NO.
5
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-5-Road P&P2.dwg



PLAN VIEW OF ROAD NO. 477 - STA. 8+50 TO STA. 13+00

0 25 50
SCALE IN FEET



PROFILE VIEW OF ROAD NO. 477 - STA. 8+50 TO STA. 13+00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-6-Road P&P3.dwg

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

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DESIGNED: JDE
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DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

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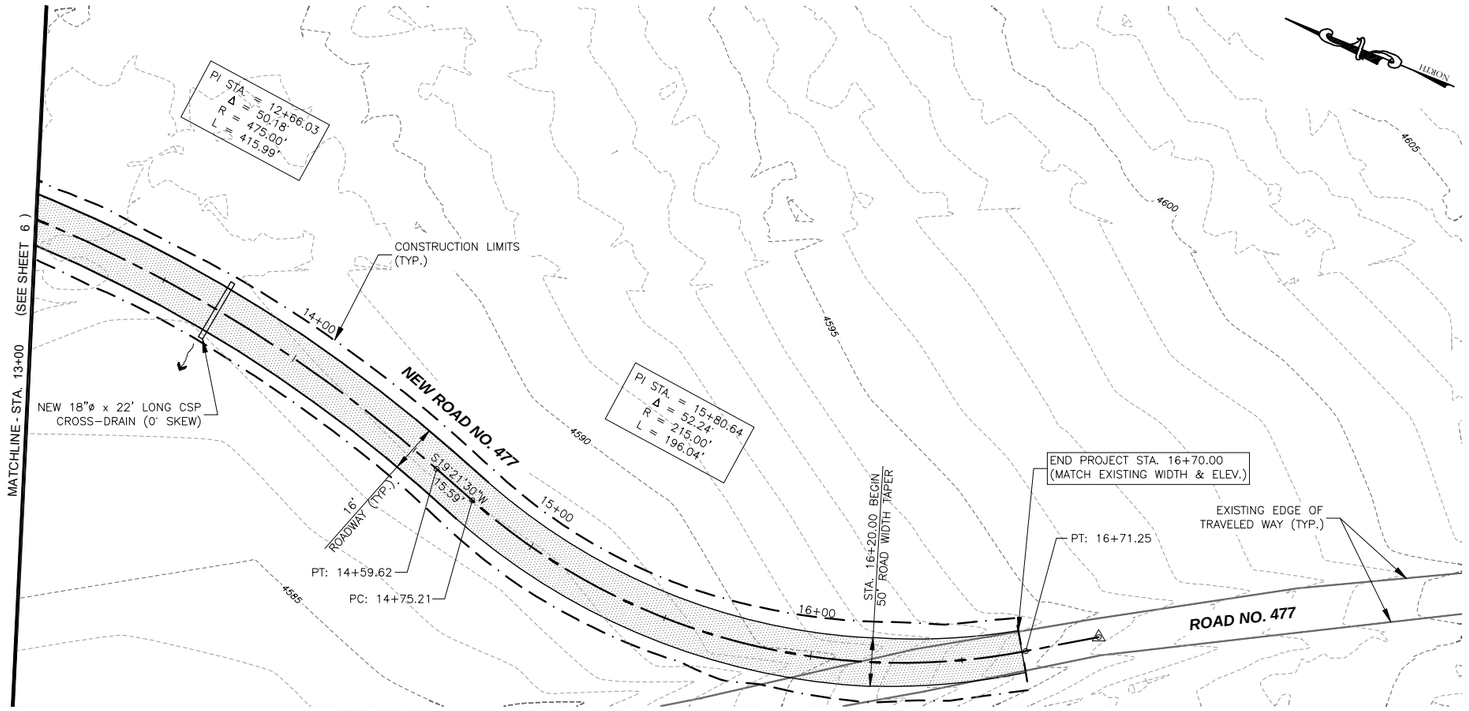
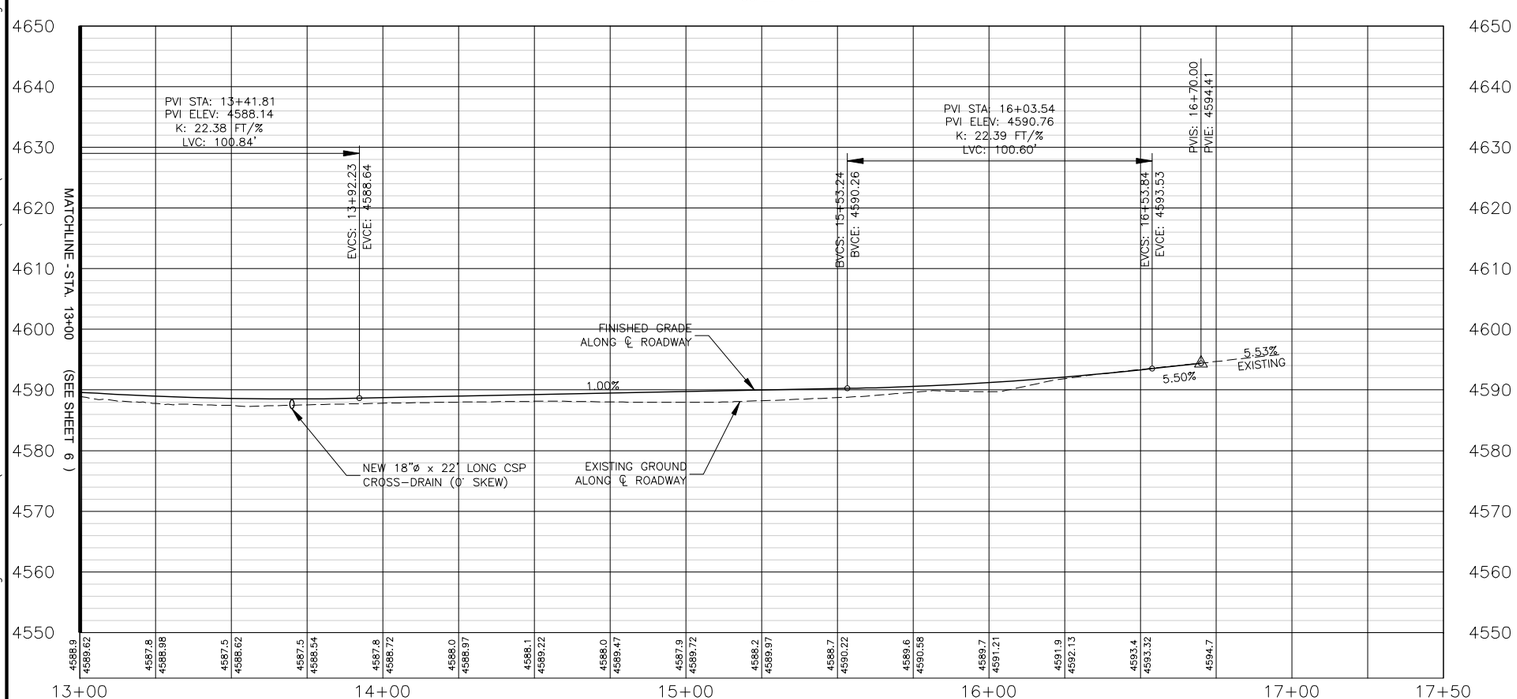
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROAD PLAN & PROFILE - STA. 8+50 TO STA. 13+00

SHEET NO.
6
OF 18



PLAN VIEW OF ROAD NO. 477 - STA. 13+00 TO STA. 17+50



PROFILE VIEW OF ROAD NO. 477 - STA. 13+00 TO STA. 17+50

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-7-Road P&P4.dwg

50% SUBMITTAL

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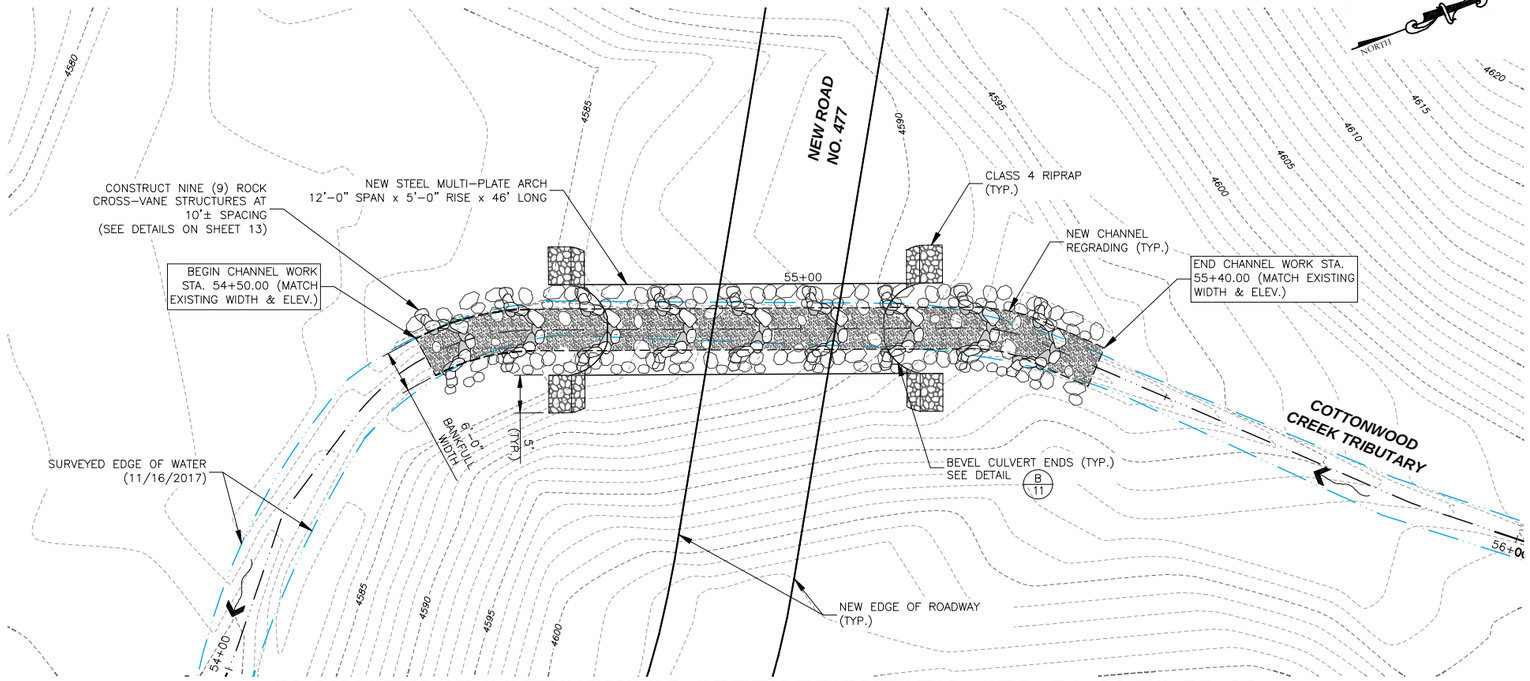
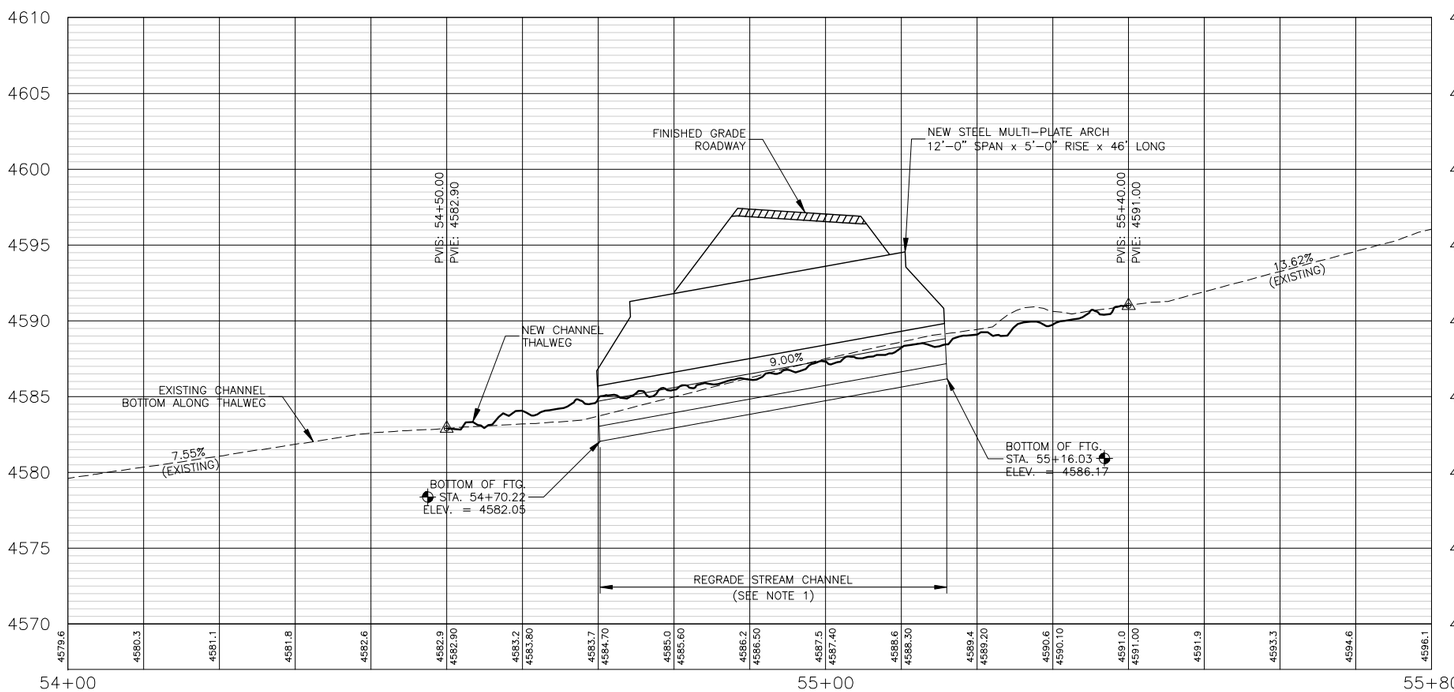
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROAD PLAN & PROFILE - STA. 13+00 TO STA. 17+50

SHEET NO.
7
OF 18



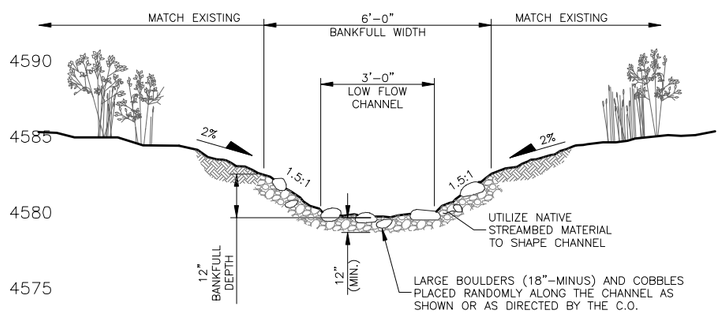
PLAN VIEW OF COTTONWOOD CREEK TRIBUTARY - STA. 54+00 TO 55+80

0 10 20
SCALE IN FEET



PROFILE VIEW OF COTTONWOOD CREEK TRIBUTARY - STA. 54+00 TO STA. 55+80

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



TYPICAL CHANNEL SECTION

NOT TO SCALE

NOTES:

1. UTILIZE NATIVE STREAMBED MATERIAL TO REGRADE AND SHAPE THE CHANNEL WITHIN THE CULVERT PER THE DETAILS ON SHEET 11. REGRADE AND SHAPE THE CHANNEL OUTSIDE THE CULVERT PER THE TYPICAL CHANNEL SECTION DETAIL ON THIS SHEET. THIS WORK SHALL BE PAID UNDER ITEM 64801.
2. CONTRACTOR SHALL USE SUITABLE ON-SITE MATERIAL FROM STRUCTURE EXCAVATION AND NEW CHANNEL GRADING AT THE EXISTING CROSSING FOR STREAMBED SIMULATION MATERIAL. SORTING WILL BE REQUIRED TO MEET THE REQUIREMENTS SPECIFIED IN FSSS 705.
3. STREAMBED MATERIAL TO BE INSTALLED NON-UNIFORMLY.
4. LARGER BOULDERS (18"-MINUS) AND COBBLE THAT ARE ENCOUNTERED IN THE CHANNEL EXCAVATION AREAS SHALL BE USED TO CONSTRUCT BANK MARGINS OF NEW CHANNEL AND SHALL BE RANDOMLY PLACED WITHIN THE CHANNEL AS DIRECTED BY THE C.O. IF ADDITIONAL MATERIAL IS NEEDED THE CONTRACTOR SHALL IMPORT ADDITIONAL ROCK FROM THE CONTRACTORS RIPRAP SOURCE. THIS WORK IS PAID UNDER ITEM 64801.
5. BOULDERS SHOWN ON THIS SHEET ARE NOT TO SCALE. THEY ARE SHOWN TO GIVE A CONCEPTUAL REPRESENTATION OF THE RECONSTRUCTED CHANNEL.
6. CHANNEL EXCAVATION AND EMBANKMENT QUANTITIES ARE FOR INFORMATION ONLY AND ARE CALCULATED TO THE CHANNEL FINISH GRADE.
7. CONTRACTOR SHALL SALVAGE VEGETATED SOILS MATS, OTHER RIPARIAN VEGETATION, AND TOP SOIL PRIOR TO CLEARING AND GRUBBING AS DIRECTED BY THE C.O. VEGETATION WILL BE PLACED ON THE STREAM BANKS ABOVE BANKFULL AS DIRECTED BY THE C.O. PLACING SOIL MATS AND RIPARIAN VEGETATION SHALL BE PAID UNDER ITEM 62201. PLACING SALVAGED TOPSOIL SHALL BE PAID UNDER ITEM 20804.
8. TO OPTIMIZE TRANSPLANT SUCCESS, OVER-EXACAVATE A DIVOT FOR SOIL MAT OR OTHER RIPARIAN VEGETATION. PLACE FILL MATERIAL IN DIVOT HOLE SURROUNDING PLANT TO NATURAL CONTOUR. COMPACT THOROUGHLY. WATER IMMEDIATELY WITH EXCAVATOR BUCKET.

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

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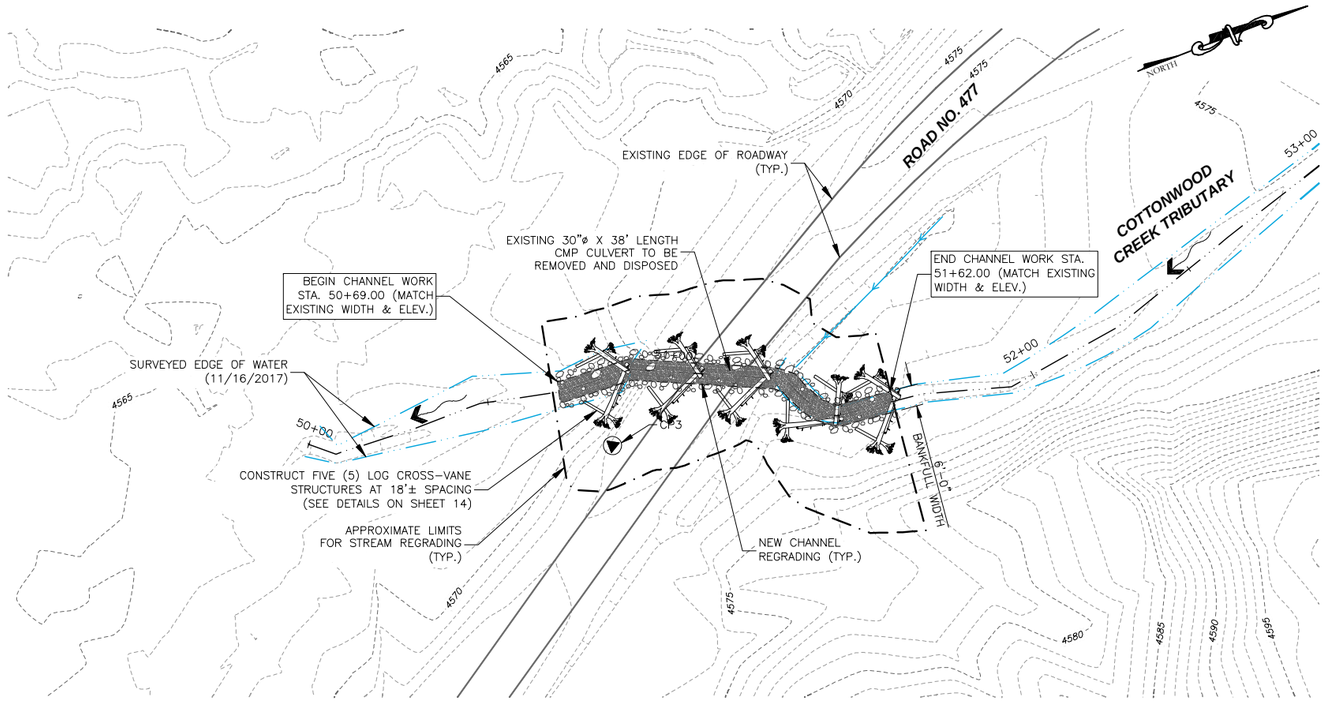
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5
STREAM PLAN & PROFILE

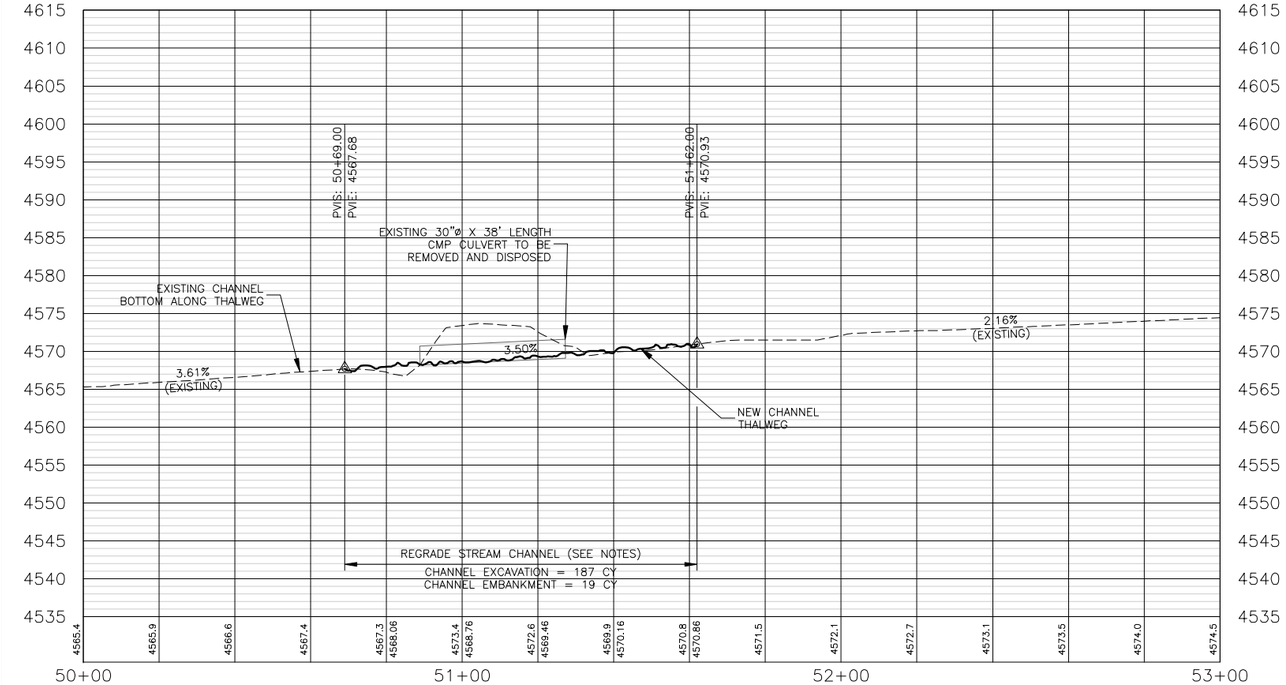
SHEET NO.
8
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-8-Stream P&P.dwg



PLAN VIEW OF COTTONWOOD CREEK TRIBUTARY - STA. 50+00 TO 53+00

0 20 40
SCALE IN FEET

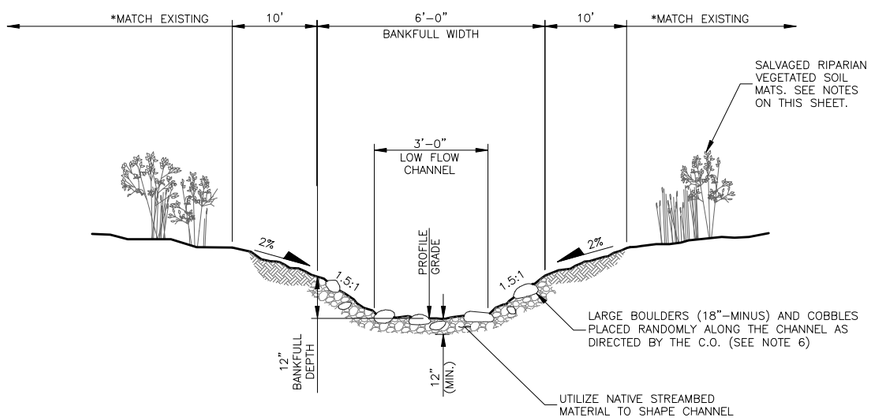


HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 20'

PROFILE VIEW OF COTTONWOOD CREEK TRIBUTARY - STA. 50+00 TO STA. 53+00

NOTES:

1. ALL WORK ASSOCIATED WITH STREAM REGRADING SHALL BE PAID UNDER ITEM 21102 UNLESS OTHERWISE SPECIFIED.
2. UTILIZE NATIVE STREAMBED MATERIAL TO SHAPE THE CHANNEL PER THE TYPICAL CHANNEL SECTION DETAIL ON THIS SHEET.
3. CONTRACTOR SHALL USE SUITABLE ON-SITE MATERIAL FROM STRUCTURE EXCAVATION AND NEW CHANNEL GRADING AT THE EXISTING CROSSING FOR STREAMBED SIMULATION MATERIAL. SORTING WILL BE REQUIRED TO MEET THE REQUIREMENTS SPECIFIED IN FSSS 705.
4. STREAMBED MATERIAL TO BE INSTALLED NON-UNIFORMLY.
5. LARGER BOULDERS (18"-MINUS) AND COBBLE THAT ARE ENCOUNTERED IN THE CHANNEL EXCAVATION AREAS SHALL BE USED TO CONSTRUCT BANK MARGINS OF NEW CHANNEL AND SHALL BE RANDOMLY PLACED WITHIN THE CHANNEL AS DIRECTED BY THE C.O. IF ADDITIONAL MATERIAL IS NEEDED THE CONTRACTOR SHALL IMPORT ADDITIONAL ROCK FROM THE CONTRACTORS RIPRAP SOURCE.
6. BOULDERS SHOWN ON THIS SHEET ARE NOT TO SCALE. THEY ARE SHOWN TO GIVE A CONCEPTUAL REPRESENTATION OF THE RECONSTRUCTED CHANNEL.
7. CHANNEL EXCAVATION AND EMBANKMENT QUANTITIES ARE FOR INFORMATION ONLY AND ARE CALCULATED TO THE CHANNEL FINISH GRADE.
8. CONTRACTOR SHALL SALVAGE VEGETATED SOILS MATS, OTHER RIPARIAN VEGETATION, AND TOP SOIL PRIOR TO CLEARING AND GRUBBING AS DIRECTED BY THE C.O. VEGETATION WILL BE PLACED ON THE STREAM BANKS ABOVE BANKFULL AS DIRECTED BY THE C.O.
9. TO OPTIMIZE TRANSPLANT SUCCESS, OVER-EXACAVATE A DIVOT FOR SOIL MAT OR OTHER RIPARIAN VEGETATION. PLACE FILL MATERIAL IN DIVOT HOLE SURROUNDING PLANT TO NATURAL CONTOUR. COMPACT THOROUGHLY. WATER IMMEDIATELY WITH EXCAVATOR BUCKET.
10. DIVERT COTTONWOOD CREEK TRIBUTARY AROUND THE WORK AREA WHILE THE NEW CHANNEL IS BEING CONSTRUCTED. THE CONTRACTOR MAY SALVAGE AND REUSE THE EXISTING CULVERT FOR THE DIVERSION. THE COMPLETE DESIGN OF THE STREAM DIVERSION IS THE RESPONSIBILITY OF THE CONTRACTOR. SUBMIT A DEWATERING PLAN TO THE C.O. FOR APPROVAL.
11. LOG AND WOOD MATERIAL TO BE SALVAGED ON-SITE FROM CLEARING AND GRUBBING FOR USE AS LOG CROSS-VANES. LOG CROSS-VANES SHALL BE PAID UNDER ITEM 64808b.
12. CONTRACTOR SHALL MULCH THE OBLITERATED ROADWAY 100' ON BOTH SIDES OF THE CULVERT REMOVAL



*REFER TO SHEET _ FOR STREAM REGRADING CROSS-SECTIONS

TYPICAL CHANNEL SECTION

NOT TO SCALE

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
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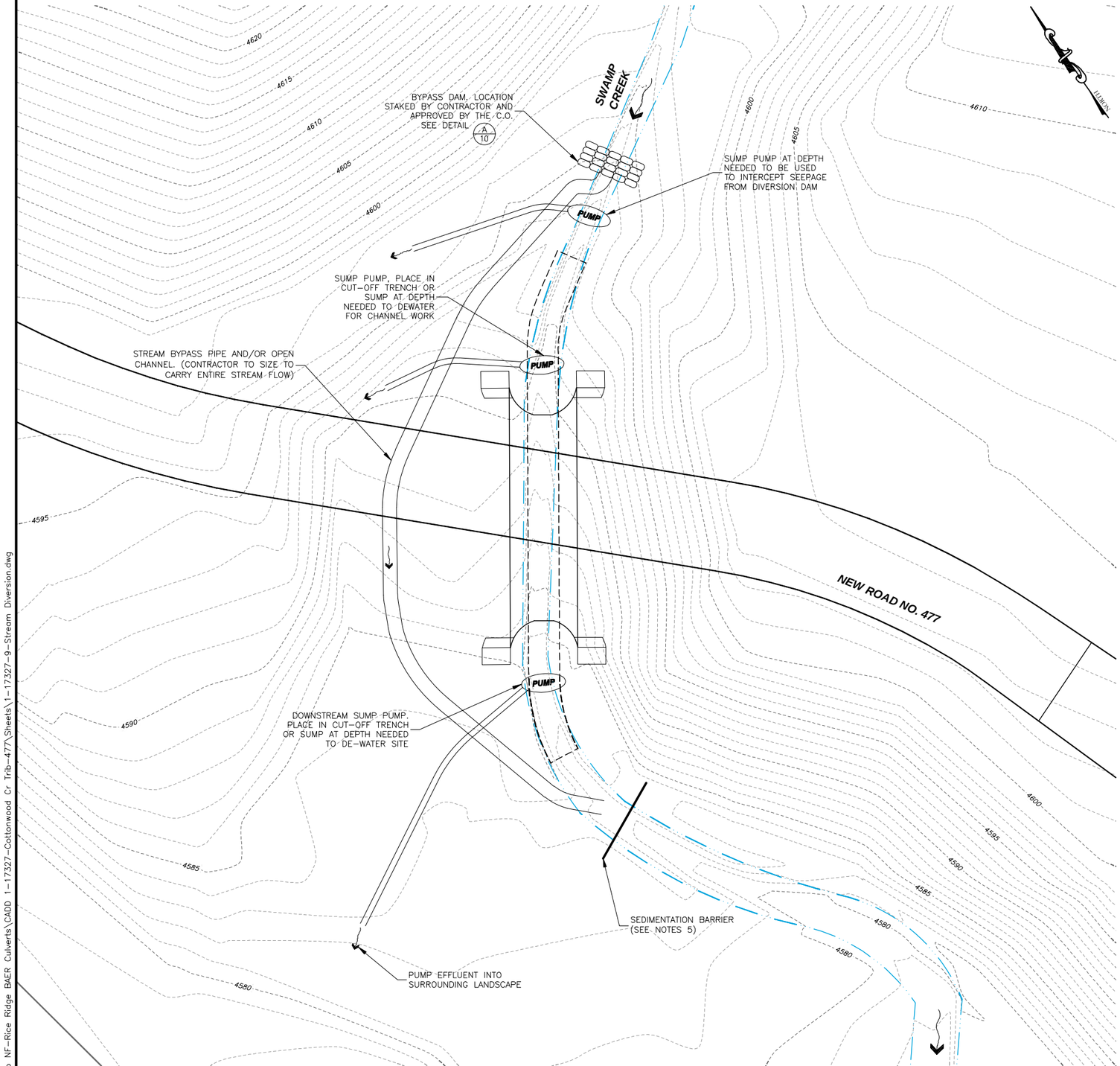
ROAD NO. 477 - M.P. - 10.5
STREAM REGRADING PLAN

SHEET NO.
9
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-9-Stream Regrading P&P.dwg

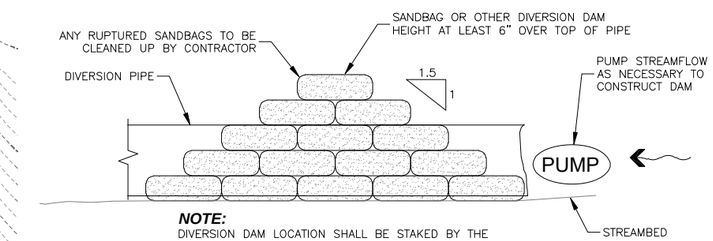


STREAM DIVERSION PLAN

0 10 20
SCALE IN FEET

NOTES:

1. DEWATER THE EXCAVATION IN ACCORDANCE WITH FP-14 SECTIONS 208, 209 AND 157 AND THE REQUIREMENTS ON THIS SHEET.
2. DEWATERING IS THE RESPONSIBILITY OF THE CONTRACTOR AND CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE C.O. FOR APPROVAL ALONG WITH THE EXCAVATION PLAN. THIS SHEET ILLUSTRATES GENERIC DEWATERING REQUIREMENTS AND POSSIBLE METHODS AND EQUIPMENT AND IS NOT CONSIDERED ADEQUATE FOR THIS PROJECT. CONTRACTOR SHALL DEVELOP THEIR OWN PROJECT SPECIFIC DEWATERING PLANS AND SHALL INCLUDE DRAWINGS AND A WRITTEN OUTLINE ILLUSTRATING AND DESCRIBING PROPOSED LAYOUT, METHODS, EQUIPMENT, AND ANTICIPATED STREAM FLOW VOLUMES. APPROVAL OF THE DEWATERING PLAN BY THE CONTRACTING OFFICER DOES NOT RELIEVE THE CONTRACTOR FROM COMPLETING THE WORK AS SPECIFIED. IF CONTRACTOR'S IDENTIFIED DEWATERING METHODS ARE NOT PRODUCING DESIRED RESULTS, CONTRACTOR SHALL RE-EVALUATE AND SUBMIT ANOTHER PLAN TO THE C.O. FOR APPROVAL. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK. ALL WORK RELATING TO THE STREAM DIVERSION IS PAID UNDER ITEM 15713.
3. CONTRACTOR IS RESPONSIBLE FOR SIZING ALL PUMPS, DAMS, BYPASS PIPES, OPEN CHANNELS, ETC. AND WILL NEED TO MAINTAIN PUMPING CAPACITY OF THE INFLOW DURING THE DURATION OF THE PROJECT. PUMPS TO BE PLACED IN LOCATION OR WITHIN SECONDARY CONTAINMENT TO PREVENT FUEL/OIL FROM SPILLING INTO THE STREAM. CONTRACTOR TO BE RESPONSIBLE FOR CLEANUP OF ANY FUEL/OIL SPILL.
4. SOIL EROSION AND SEDIMENT CONTROL MEASURES SPECIFIC TO THE DE-WATERING PLAN SHALL BE INCLUDED AND SHALL BE IN CONFORMANCE WITH PROJECT PERMITS.
5. INSTALL SEDIMENTATION BARRIER DOWNSTREAM OF WORK. THE BARRIER MAY CONSIST OF EITHER ONE OR A COMBINATION OF THE FOLLOWING: STRAW BALES OR SILT FENCE. INSTALL BARRIER PRIOR TO COMMENCEMENT OF WORK. THE LOCATION OF THE BARRIER WILL BE LOCATED BY THE CONTRACTOR AND APPROVED BY THE C.O. THIS WORK IS PAID UNDER ITEM 15713.
6. CONTRACTOR SHALL GIVE 2 DAYS NOTICE BEFORE DEWATERING. DEWATERING SHALL TAKE PLACE FIRST THING IN THE MORNING AND NO IN-STREAM WORK OR WORK NEARBY SHALL TAKE PLACE FOR THE REST OF THE DAY. REWATERING WILL ALSO BE DONE SLOWLY IN A MANNER TO REDUCE SEDIMENTATION.
7. CLEARING LIMITS WILL VARY DEPENDING ON THE DIVERSION PLAN SUBMITTED BY THE CONTRACTOR. CONTRACTOR TO SUBMIT PROPOSED CLEARING LIMITS WITH DIVERSION PLAN.
8. PUMP SCREEN OPENINGS SHALL NOT EXCEED 3/32" OR 0.0938" (2.38mm). IF THE DIVERSION INLET IS NOT SCREENED, THE DIVERSION OUTLET WILL BE PLACED IN A LOCATION THAT FACILITATES SAFE RE-ENTRY OF FISH INTO THE STREAM CHANNEL.



NOTE:
DIVERSION DAM LOCATION SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE C.O

A/10 **DIVERSION DAM DETAIL**
NOT TO SCALE

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE
REGION ONE

GreatWest engineering®
2501 BELT VIEW DRIVE
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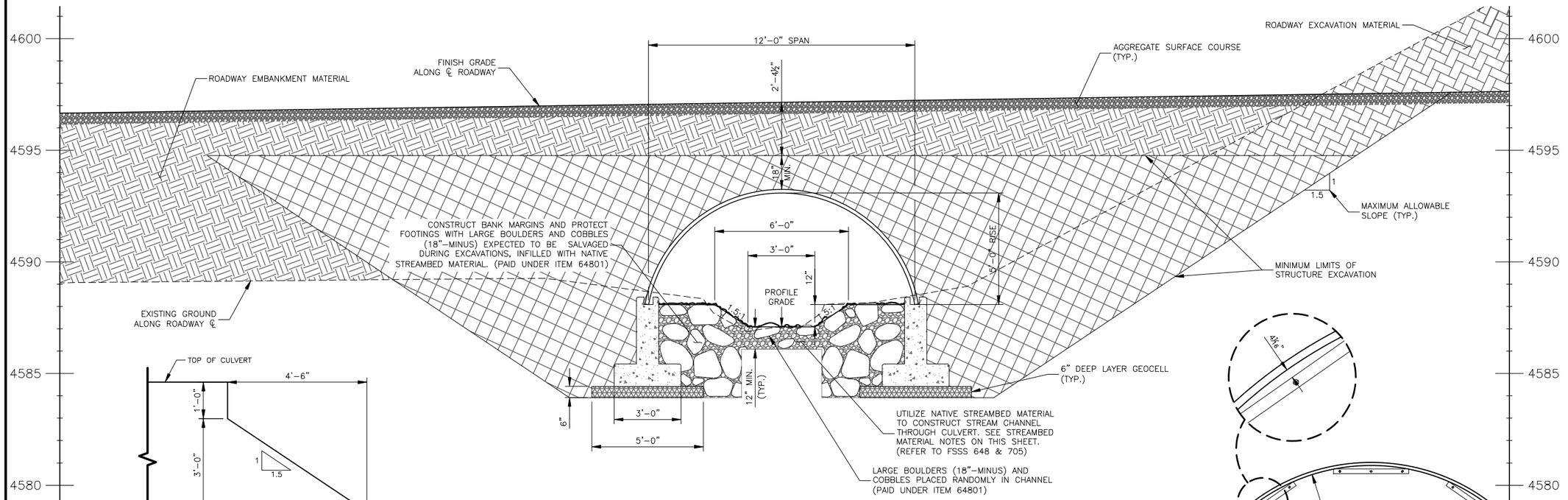
(406)449-8627

LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5
STREAM DIVERSION PLAN

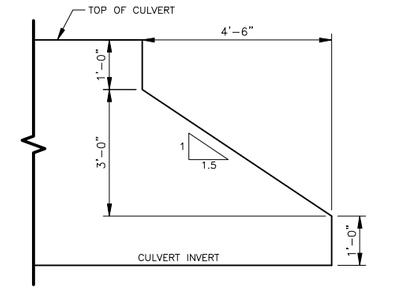
SHEET NO.
10
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-9-Stream Diversion.dwg



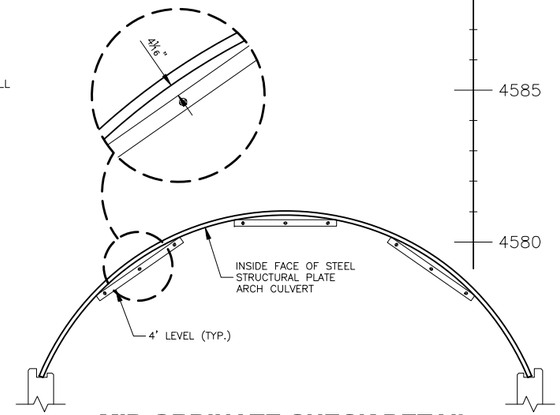
TYPICAL SECTION - STEEL PIPE-ARCH CULVERT

SCALE: 1" = 5'



B / 11 **CULVERT END TREATMENT**

NOT TO SCALE



MID-ORDINATE CHECK DETAIL

SCALE: NOT TO SCALE

NOTES:

1. PRIOR TO BACKFILLING, CHECK THE SPAN AND RISE. VERIFY THAT THE MEASUREMENTS ARE WITHIN THE MANUFACTURERS TOLERANCES. CHECK AND RECORD THE CULVERT RADIUS BY MEASURING THE MIDDLE ORDINATE AT THREE LOCATIONS ALONG THE ROOF OF THE CULVERT AS SHOWN WITH A 4' LEVEL. TAKE MEASUREMENTS ALONG THE FULL LENGTH OF THE PIPE. MARK ALL SAMPLE LOCATIONS WITH PAINT. VERIFY THAT THE MID–ORDINATE MEASUREMENTS FALL WITHIN THE RANGE SHOWN ON THE DETAIL.
2. DURING BACKFILLING CONTINUE TO CHECK THE CULVERT AT THE MARKED LOCATIONS AS OUTLINED ABOVE. ADJUST MATERIAL PLACEMENT AND COMPACTION PROCEDURES TO CORRECT ANY DETECTED CHANGE IN SHAPE DURING BACKFILLING.

CULVERT SHAPE CHECK TABLE

MEASUREMENT	*DESIGN*	*ALLOWED RANGE*	
		MINIMUM	*MAXIMUM*
MID-ORDINATE "M"	4 1/16"	3 15/16"	4 3/16"

*ALL MEASUREMENTS ARE TO THE INSIDE CREST OF CORRUGATIONS.

3. CONTRACTOR SHALL ALSO MEASURE THE SPAN AND RISE OF THE CULVERT DURING BACKFILLING TO ENSURE THERE IS NO MORE THAT A 2% (±) VARIATION FROM THE SPECIFIED SPAN AND RISE.

STRUCTURE EXCAVATION NOTES:

1. STRUCTURE EXCAVATION SHALL BE COMPLETED IN ACCORDANCE WITH FP–14, SECTION 208.
2. LIMITS SHOWN ARE MINIMUM EXCAVATION REQUIREMENTS BASED ON ENGINEERS DETERMINATION OF OSHA SOIL TYPE C AND OSHA EXCAVATION REQUIREMENTS. DETERMINATION IS BASED ON LIMITED SURFACE DATA AND ACTUAL SITE CONDITIONS MAY VARY.
3. STRUCTURE EXCAVATION QUANTITY SHOWN IS FOR INFORMATION ONLY BASED ON THE LIMITS SHOWN. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL QUANTITIES BASED ON THEIR OWN EXCAVATION PLAN.
4. CONTRACTOR SHALL SUBMIT EXCAVATION PLAN TO C.O. FOR APPROVAL. PLAN SHALL INCLUDE DRAWINGS AND WRITTEN OUTLINE ILLUSTRATING AND DESCRIBING PROPOSED EXCAVATION LIMITS, METHODS, EQUIPMENT, LOCATION OF STOCKPILES, AND ESTIMATED QUANTITIES MUST COMPLY WITH OSHA EXCAVATION SOIL TYPING AND REQUIREMENTS. CHANGES TO THE EXCAVATION LIMITS SHOWN ON THIS SHEET FOR CONTRACTOR'S DEWATERING METHODS OR OTHER CONTRACTOR CONVENIENCE, MUST BE SHOWN ON THE CONTRACTOR'S PLAN AND ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS WORK IS PAID UNDER ITEM 20804.
5. APPROXIMATELY 80 PERCENT OF THE STRUCTURE EXCAVATION MATERIAL IS ANTICIPATED TO BE SUITABLE FOR USE AS ROADWAY EMBANKMENT AND STREAMBED MATERIAL.
   A. MUST HAVE APPROVAL FROM C.O. PRIOR TO REUSE.
   B. MIXING, SORTING, AND DRYING MAY BE REQUIRED PRIOR TO RE–USE.

STRUCTURAL BACKFILL:

1. STRUCTURAL BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH FP–14 SECTION 208 OR MANUFACTURERS RECOMMENDATIONS. THE PROCTOR DENSITY FOR STRUCTURAL BACKFILL MATERIAL SHALL BE OBTAINED IN ACCORDANCE WITH *AASHTO T99, METHOD C* . SAMPLING AND TESTING IS REQUIRED PER FP–14 TABLE 208–1.
2. STRUCTURAL BACKFILL LIMITS SHOWN ARE MINIMUM REQUIREMENTS. ANY BACKFILL OUTSIDE THE SHOWN LIMITS SHALL BE CONSIDERED ROADWAY EMBANKMENT AND MUST MEET THE REQUIREMENTS OUTLINED IN FSSS SECTION 204.
3. PLACE STRUCTURAL BACKFILL IN HORIZONTAL LAYERS THAT DO NOT EXCEED 6 INCHES IN COMPACTED THICKNESS.
4. COMPACTION TESTING SHALL BE PERFORMED EVERY 500 SQUARE FEET PER LIFT FOR STRUCTURAL BACKFILL AS DIRECTED BY THE C.O.
5. CONTRACTOR MAY ELECT TO USE SHANLEY PIT TO ACQUIRE STRUCTURAL BACKFILL MATERIAL. SHANLEY PIT IS LOCATED AT M.P. 0.395 ON ROAD NO. 17595. IF CONTRACTOR ELECTS TO USE SHANLEY PIT THE MATERIAL MUST BE SCREENED, SORTED, AND A PROCTOR OF THE MATERIAL SUBMITTED FOR APPROVAL TO THE C.O.

STREAMBED MATERIAL:

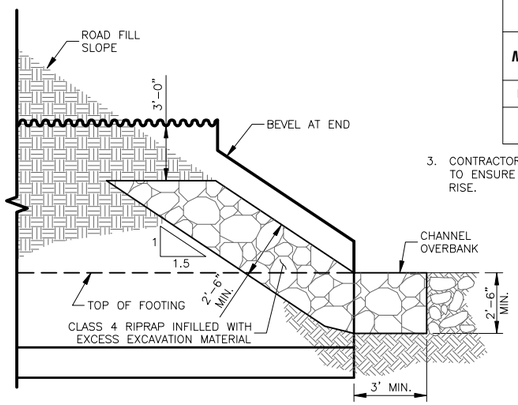
1. NATIVE STREAMBED MATERIAL SHALL BE SHAPED TO A DEPTH OF 12" WITHIN THE PROPOSED CHANNEL WORK LIMITS AS SHOWN ON SHEET # AND THE TYPICAL SECTION ON THIS SHEET. LARGE BOULDERS (18" –MINUS) AND COBBLES ENCOUNTERED DURING EXCAVATION SHALL BE RANDOMLY PLACED WITHIN THE CHANNEL AND ALONG FOOTINGS AS SHOWN ON THE TYPICAL SECTION ABOVE AND AS DIRECTED BY THE C.O.
2. STREAMBED SHALL BE INSTALLED NON–UNIFORMLY. BANKFULL WIDTH SHALL BE 6'–0" AND THE LOW FLOW CHANNEL SHALL BE 3'–0", OR AS DIRECTED BY THE C.O.
3. CONTRACTOR SHALL USE SUITABLE ON–SITE MATERIAL FROM CHANNEL AND STRUCTURE EXCAVATION FOR STREAMBED SIMULATION MATERIAL. IF NOT ENOUGH ON–SITE MATERIAL IS AVAILABLE THE C.O. WILL DESIGNATE A BORROW SITE WITHIN 1 MILE OF THE PROJECT SITE. SORTING WILL BE REQUIRED TO MEET THE REQUIREMENTS SPECIFIED IN FSSS 705.

DEWATERING AND EROSION CONTROL:

1. PROTECT AGAINST SOIL EROSION AND SEDIMENTATION DURING CONSTRUCTION IN ACCORDANCE WITH FP–14, SECTION 157 AND THE PROJECT PERMITS. CONTRACTOR SHALL PREPARE AND SUBMIT A SOIL EROSION AND SEDIMENT CONTROL PLAN TO THE C.O. FOR APPROVAL. PLAN SHALL INCLUDE DRAWINGS AND A WRITTEN OUTLINE ILLUSTRATING AND DESCRIBING PROPOSED LAYOUT, METHODS, AND EQUIPMENT.
2. DEWATER THE EXCAVATION IN ACCORDANCE WITH FP–14 SECTIONS 208, 209, 157 AND THE REQUIREMENTS ON SHEET 10.
3. CONTRACTOR SHOULD ANTICIPATE WATER INFILTRATING THE EXCAVATIONS.
4. SUBGRADE EXCAVATION, FOOTING PLACEMENT, RIPRAP PLACEMENT, STREAM CHANNEL SHAPING, AND BACKFILL ARE TO BE COMPLETED PER THE CONTRACT SPECIFICATIONS AND STANDING OR RUNNING WATER IN THE WORK AREA DOES NOT RELIEVE THE CONTRACTOR FROM MEETING THE SPECIFICATIONS.

ESTIMATED QUANTITIES

STRUCTURE EXCAVATION	431 CY
ESTIMATED SUITABLE STRUCTURE EXCAVATION MATERIAL (80%)	345 CY
TOTAL REQUIRED ROADWAY EMBANKMENT MATERIAL	1736 CY
TOTAL ROADWAY EXCAVATION MATERIAL	1938 CY
IMPORTED STRUCTURAL BACKFILL	307 CY
STREAMBED SIMULATION MATERIAL	45 CY



A / 11 **RIPRAP AT INLET & OUTLET**

NOT TO SCALE

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

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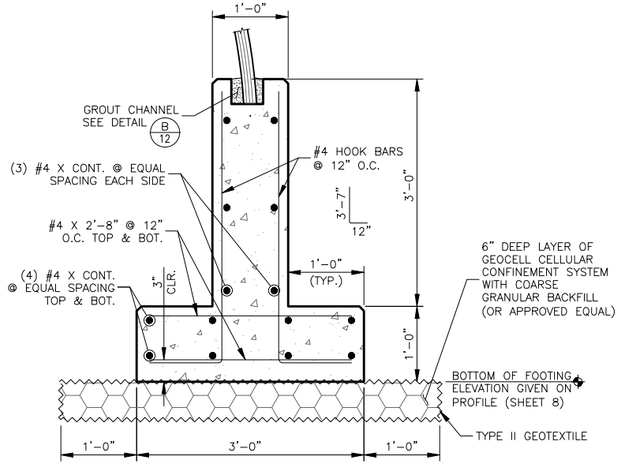
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
CULVERT DETAILS

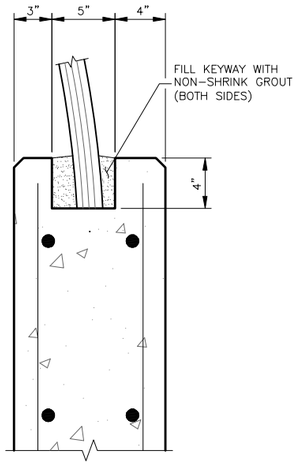
SHEET NO.
11
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-10-Culvert Details.dwg

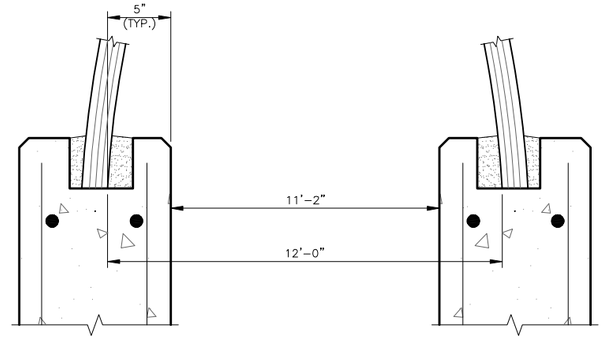


NOTE:
C.O. TO APPROVE SUBGRADE PRIOR TO GEOCELL INSTALLATION.

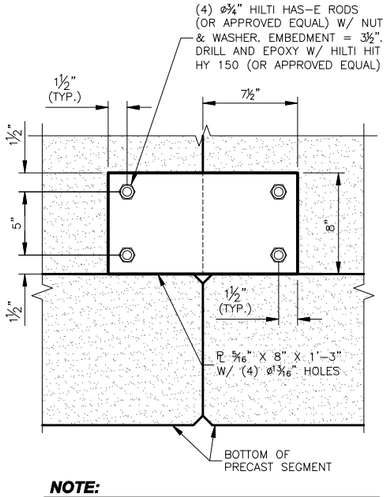
A/12 FOOTING DETAIL
SCALE: 1/2" = 1'-0"



B/12 GROUT CHANNEL DETAIL
SCALE: 1" = 1'-0"



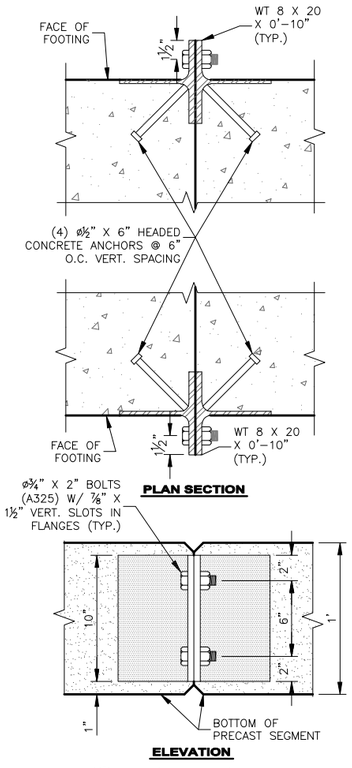
C/12 STEMWALL POSITIONING DETAIL
NOT TO SCALE



NOTE:
IN LIEU OF PRECAST MECHANICAL SPLICE CONNECTIONS AT FOOTING, ALL 4 POST-INSTALLED SPLICE PLATES MAY BE INSTALLED ON THE STEM WALL AS SHOWN ON TYPICAL PRECAST SEGMENT DETAIL.

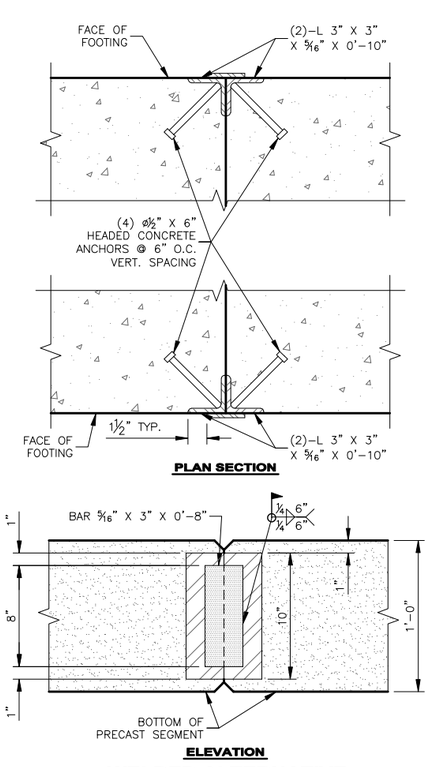
ELEVATION

POST-INSTALLED ANCHOR PLATE ALTERNATIVE



ELEVATION

BOLTED ALTERNATIVE

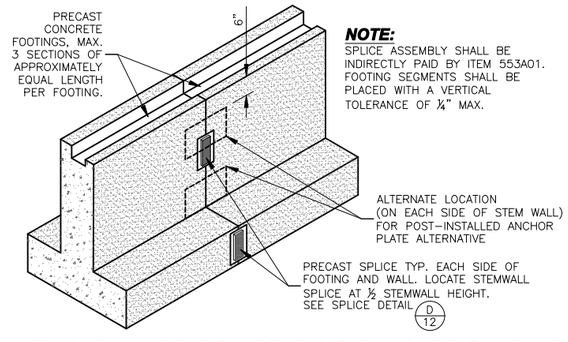


ELEVATION

WELDED ALTERNATIVE

NOTE:
FOOTING CONNECTION IS SHOWN. WALL CONNECTION IS SIMILAR.

D/12 TYPICAL FOOTING SPLICE DETAILS
NOT TO SCALE



NOTE:
SPLICE ASSEMBLY SHALL BE INDIRECTLY PAID BY ITEM 553A01. FOOTING SEGMENTS SHALL BE PLACED WITH A VERTICAL TOLERANCE OF ¼" MAX.

E/12 TYPICAL PRECAST FOOTING SEGMENTS
NOT TO SCALE

50% SUBMITTAL

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DESIGNED: JDE
DESIGN CHECKED: JJT
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DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

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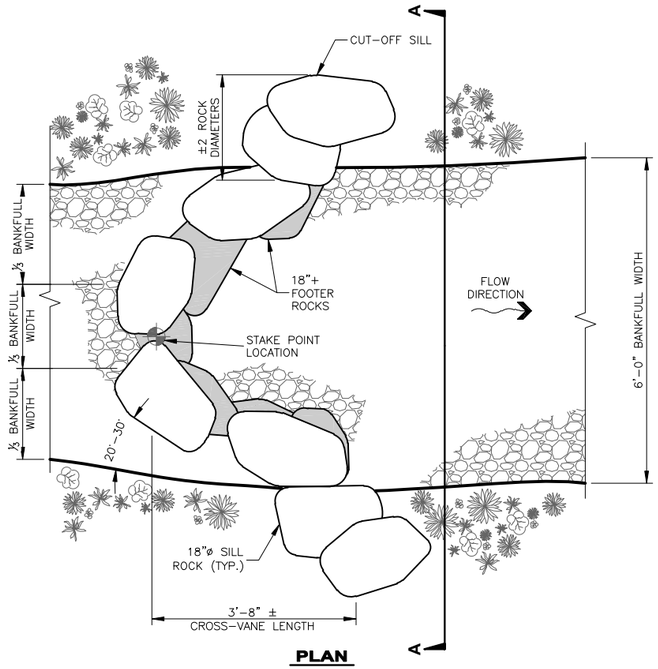
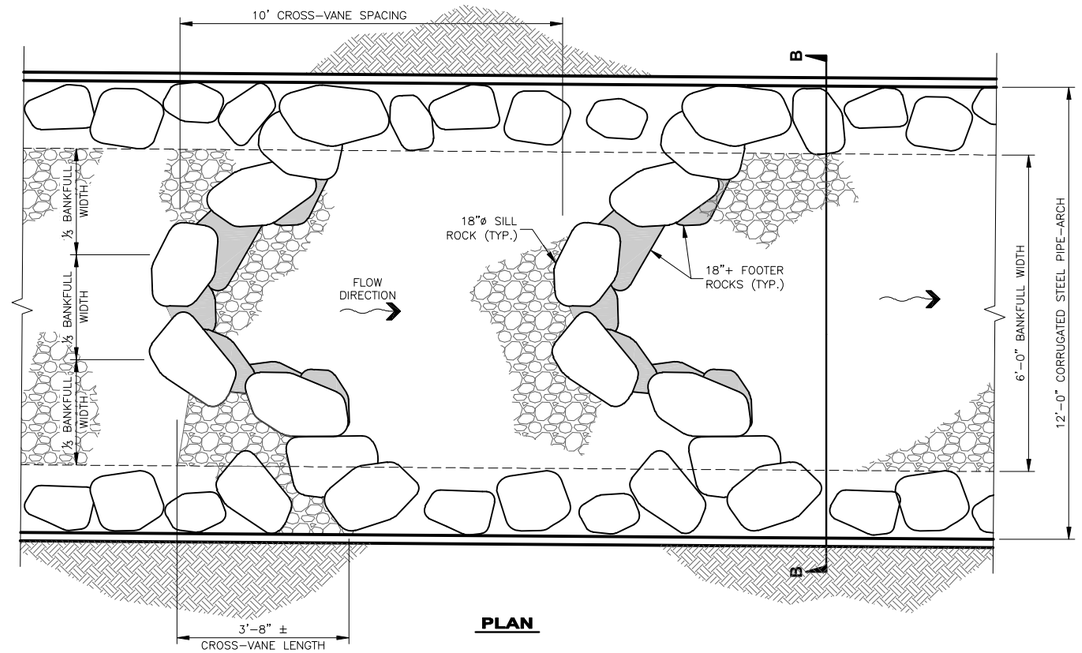
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
FOOTING DETAILS

SHEET NO.
12
OF 18

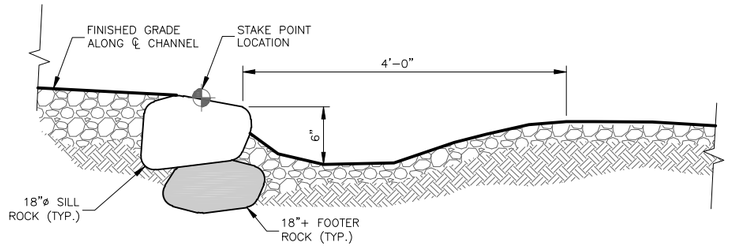
F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-11-Footing Details.dwg



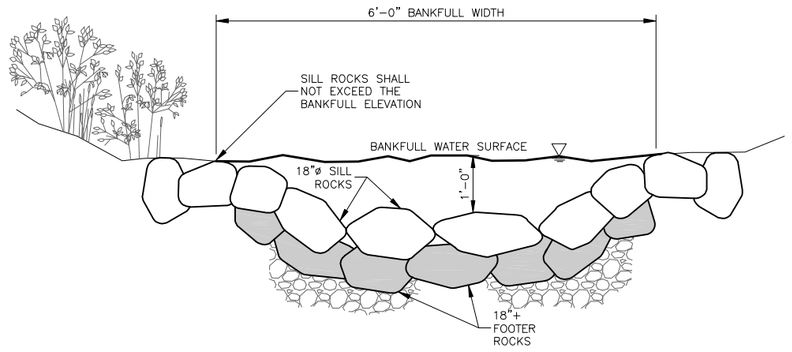
PLAN



PLAN



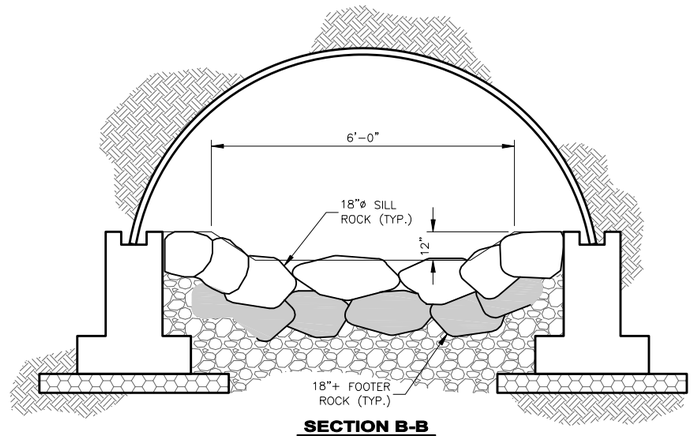
PROFILE



SECTION A-A

CROSS-VANE STRUCTURE

NOT TO SCALE



SECTION B-B

CROSS-VANE STRUCTURE (INSIDE CULVERT)

NOT TO SCALE

NOTE:
CROSS-VANE STRUCTURE (INSIDE CULVERT) DETAIL IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. SEE NOTE 4 BELOW.

NOTES:

1. MINIMIZE GAPS BETWEEN FOOTER ROCKS. BACKFILL SIDES OF FOOTER ROCKS WITH NATIVE STREAMBED GRAVEL AND COBBLE.
2. PLACE SILL ROCKS SLIGHTLY UPSTREAM OF FOOTER ROCKS. **MINIMIZE GAPS IN SILL ROCKS IN THE OUTER ⅓ CHANNEL WIDTHS. SILL ROCKS IN THE MIDDLE ⅓ OF THE CHANNEL SHALL HAVE A GAP EQUAL TO ¼ OF THE ROCK DIAMETER.**
3. THE ELEVATION DIFFERENCE BETWEEN SUCCESSIVE CROSS-VANES SHALL APPROXIMATE THE CROSS-VANE SPACING MULTIPLIED BY THE CHANNEL SLOPE.
4. THE SHAPE AND SPACING OF THE CROSS-VANE STRUCTURES SHOWN IS CONCEPTUAL AND MAY BE MODIFIED IN THE FIELD BY THE C.O. TO BEST FIT THE CHANNEL AND OTHER SITE CONDITIONS.
5. CONTRACTOR MAY USE SUITABLE ON-SITE MATERIAL FOR CROSS-VANE STRUCTURES. THE MATERIAL SHALL BE APPROVED BY THE C.O. BEFORE PLACEMENT.

NO.	REVISION DESCRIPTION	BY	DATE

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DESIGNED: JDE
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DRAWING CHECKED: JJT
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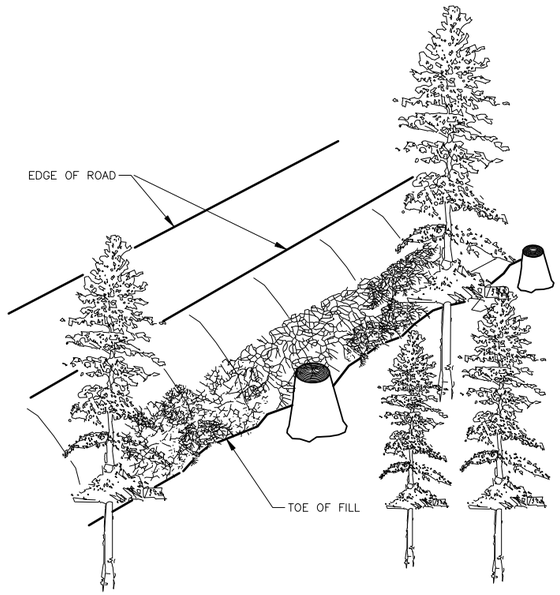
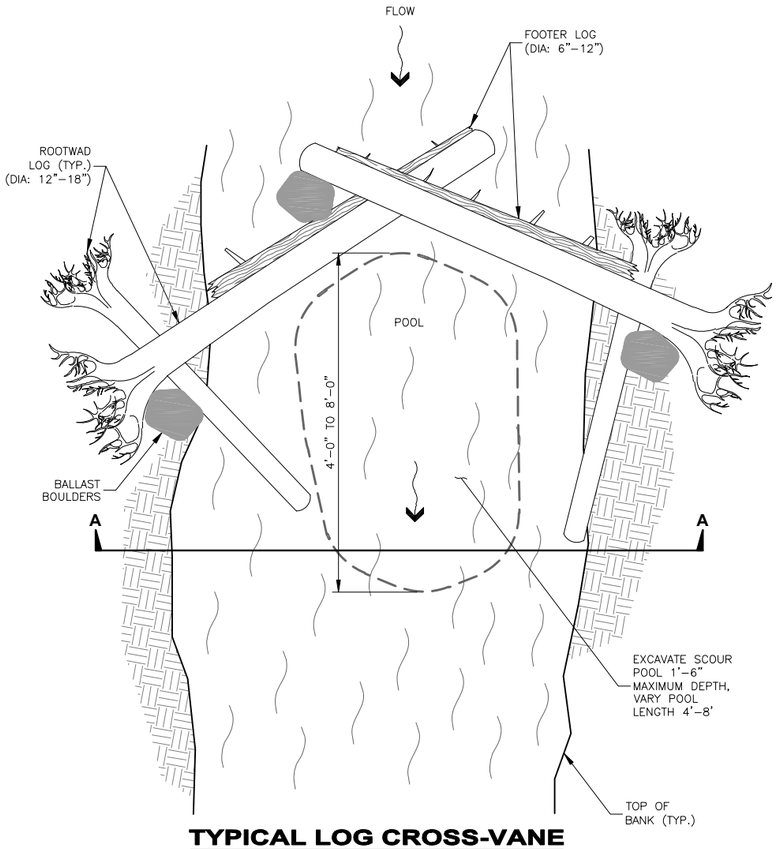
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT ROAD NO. 477 - M.P. - 10.5
ROCK CROSS-VANE DETAILS

SHEET NO.
13
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-11-Cross Vane Details.dwg

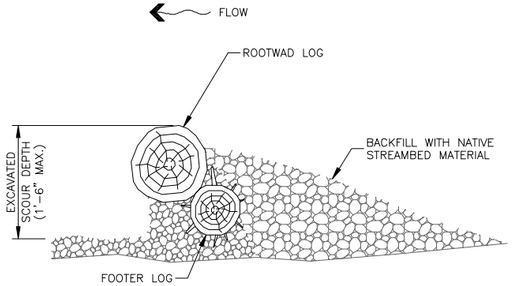


TYPICAL INSTALLATION



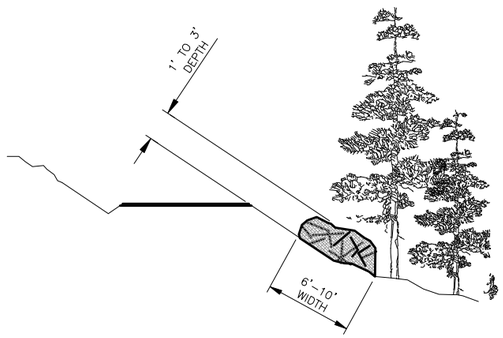
TYPICAL LOG CROSS-VANE

NOT TO SCALE



LOG CROSS-VANE DETAIL

NOT TO SCALE



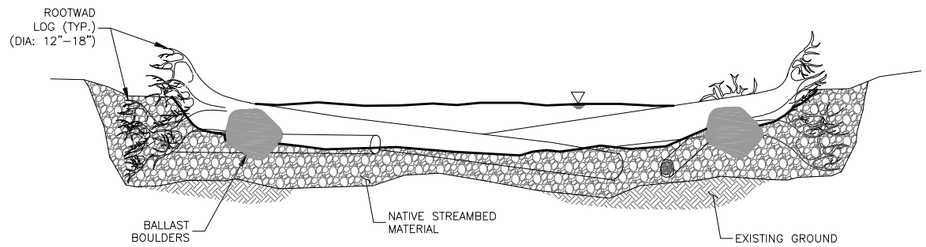
WINDROW DIMENSIONS

A/14 SLASH FILTER WINDROW DETAIL

NOT TO SCALE

SLASH FILTER WINDROW NOTES:

1. CONTRACTOR SHALL UTILIZE CLEARING AND GRUBBING MATERIAL TO ERECT SLASH FILTER WINDROW.
2. SLASH, LIMBS AND TOPS MUST BE SMALLER THAN 12 FEET LONG AND 3 INCHES IN DIAMETER. DO NOT USE STUMPS AND ROOT WADS.
3. PLACE SLASH AT THE TOE OF THE NEW FILL SLOPE WITH A BACKHOE AND TAMP INTO PLACE WITH THE BUCKET. SLASH SHOULD BE TAMPED SO IT IS EMBEDDED APPROXIMATELY 6 INCHES INTO THE SURFACE TO PREVENT WATER FROM RUNNING UNDER THE WINDROW.
4. DO NOT INTERFERE WITH THE FUNCTIONING OF DRAINAGE STRUCTURES OR BLOCK STREAM CHANNELS WITH WINDROWS. ALL LOCATIONS WILL BE STAKED OR FLAGGED BY THE C.O.
5. PLACE STUMPS ON DOWNHILL SIDE OF WINDROW AND PLACED IN A POSITION TO PREVENT ROLLING, AS DIRECTED BY THE C.O.
6. PLACE SLASH FILTER WINDROW AT THE LOCATIONS SHOWN ON SHEET 3 OR AS DIRECTED BY THE C.O..



LOG CROSS-VANE: VIEW A-A

NOT TO SCALE

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
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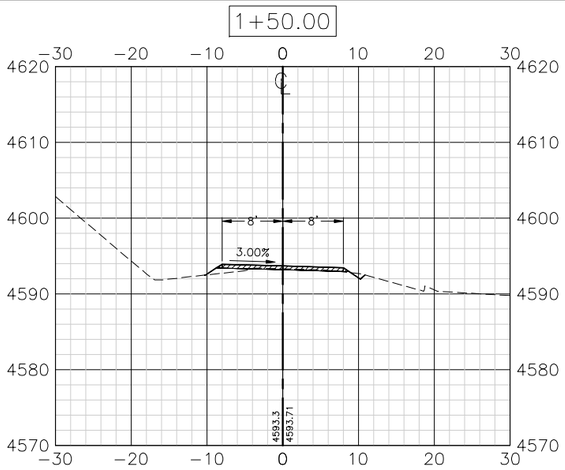
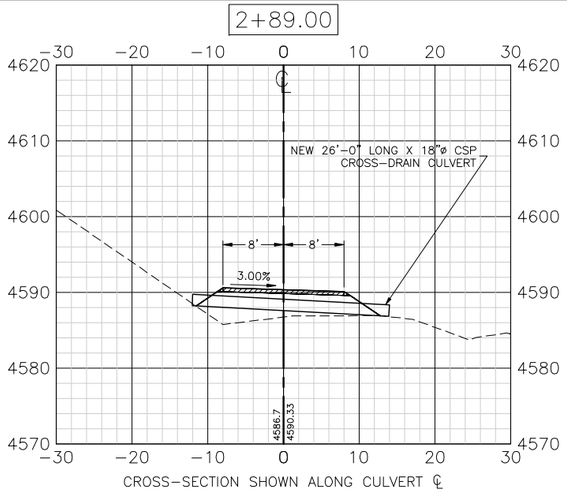
ROAD NO. 477 - M.P. - 10.5
MISCELLANEOUS DETAILS

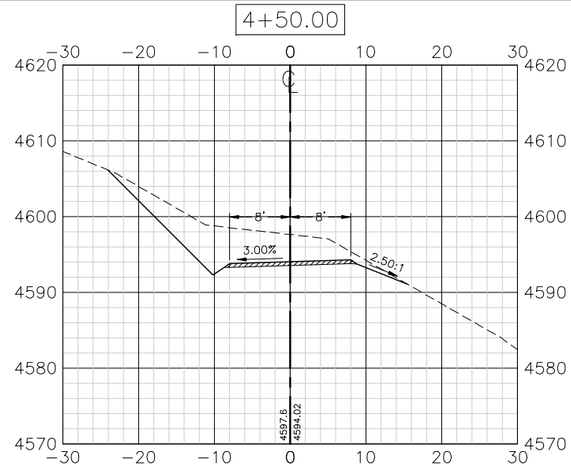
SHEET NO.
14
OF 18

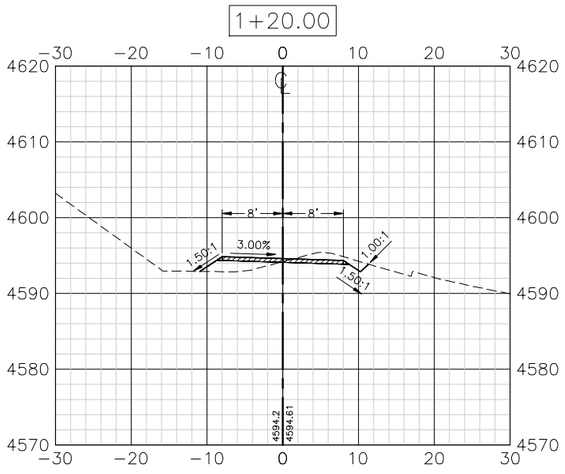
F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-12-Erosion Control Details.dwg

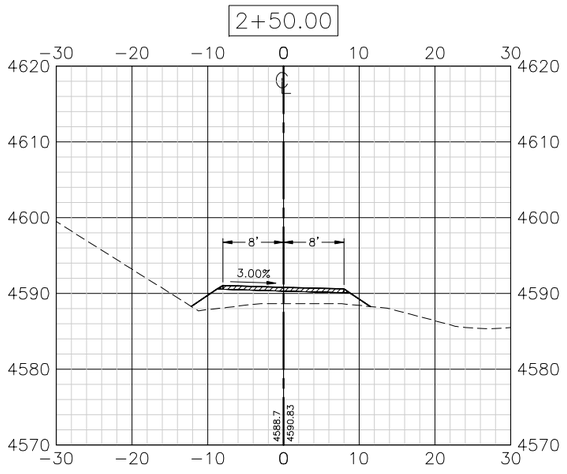


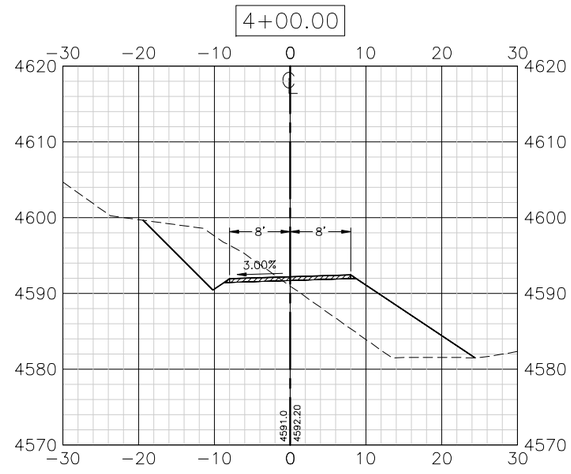


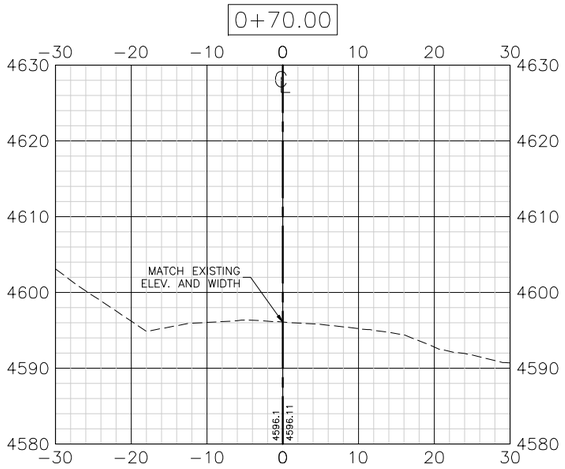
CROSS-SECTION SHOWN ALONG CULVERT ℄

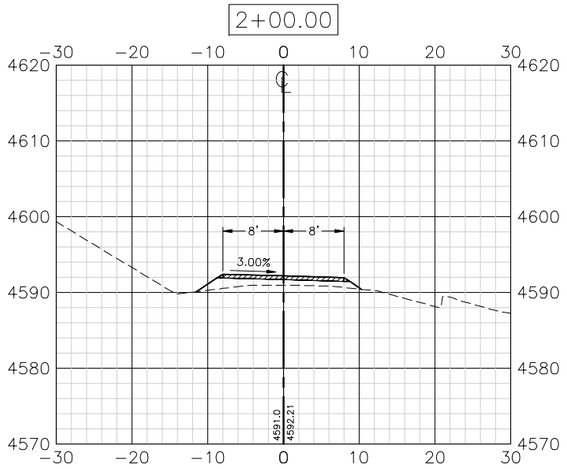


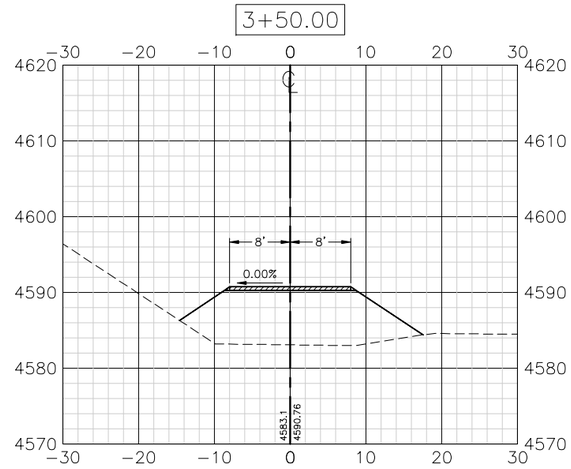












ROADWAY CROSS-SECTIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

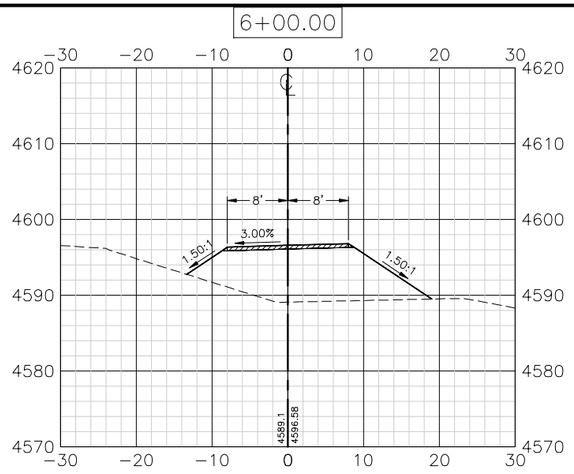
USDA FOREST SERVICE — DEPARTMENT OF AGRICULTURE — REGION ONE

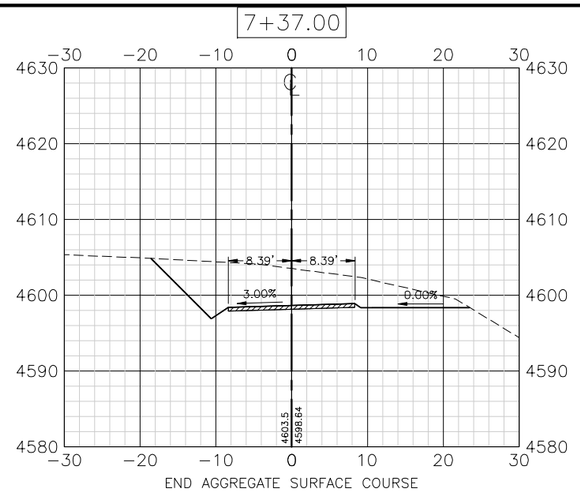
GreatWest engineering®
2501 BELT VIEW DRIVE
HELENA, MT 59601
(406)449-8627

LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROADWAY CROSS-SECTIONS

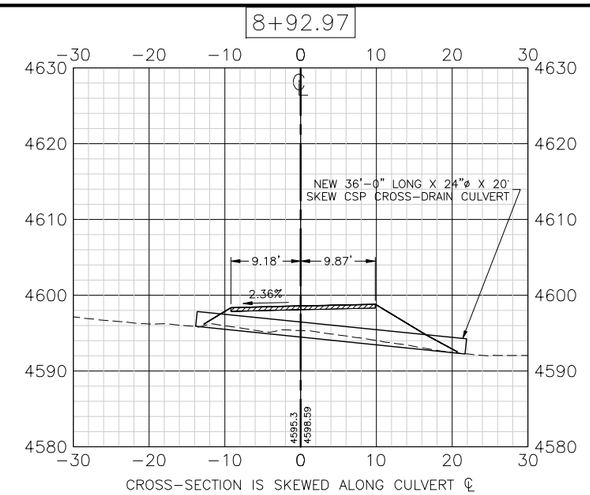
SHEET NO.
15
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-13-Roadway XSC.dwg

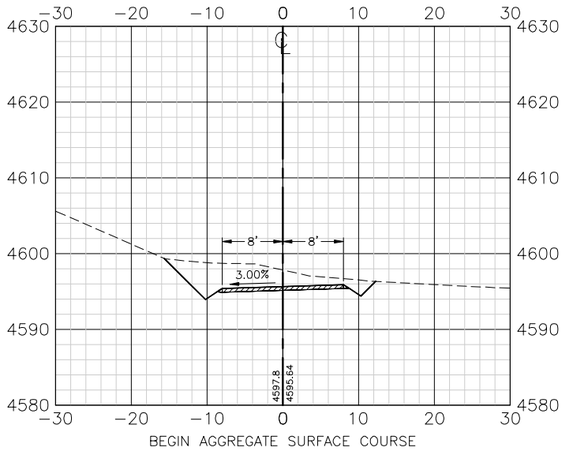




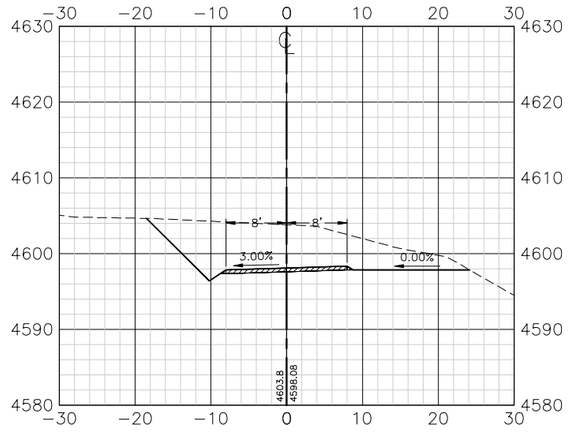
END AGGREGATE SURFACE COURSE

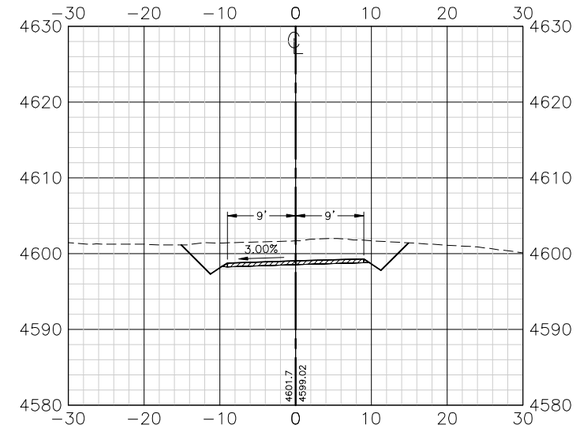


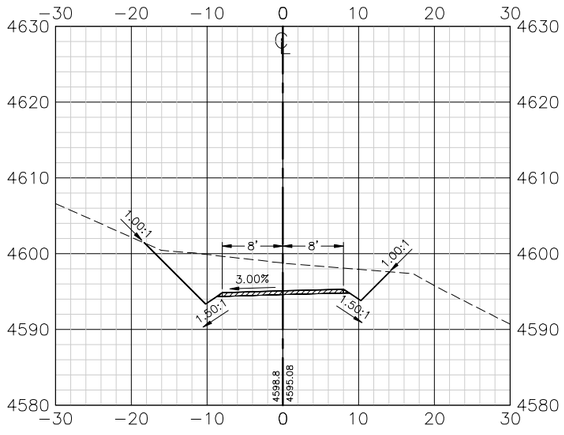
CROSS-SECTION IS SKEWED ALONG CULVERT ℄

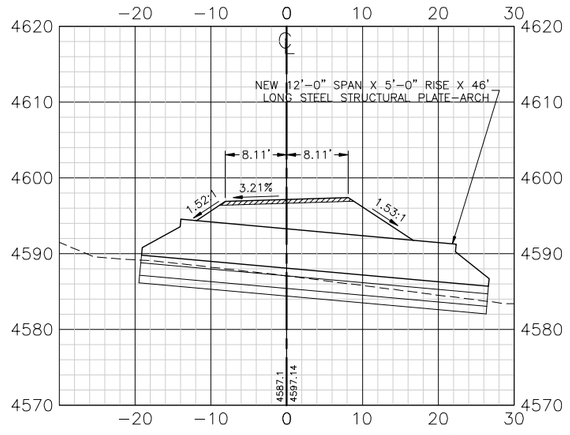


BEGIN AGGREGATE SURFACE COURSE

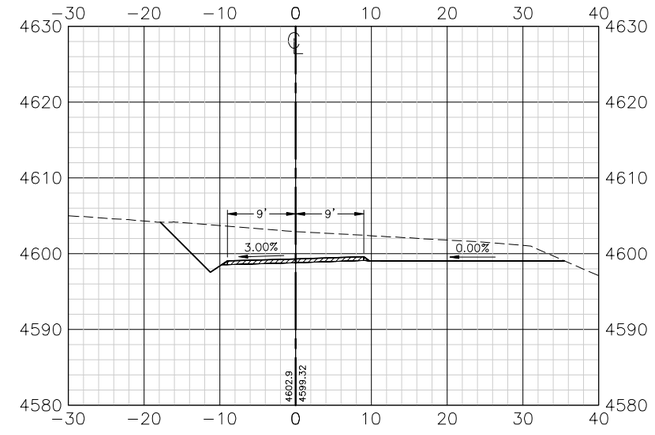








CROSS-SECTION IS SKEWED ALONG CULVERT ℄



ROADWAY CROSS-SECTIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
DRAWING CHECKED: JJT
DATE: APRIL 26, 2018

USDA FOREST SERVICE — DEPARTMENT OF AGRICULTURE — REGION ONE

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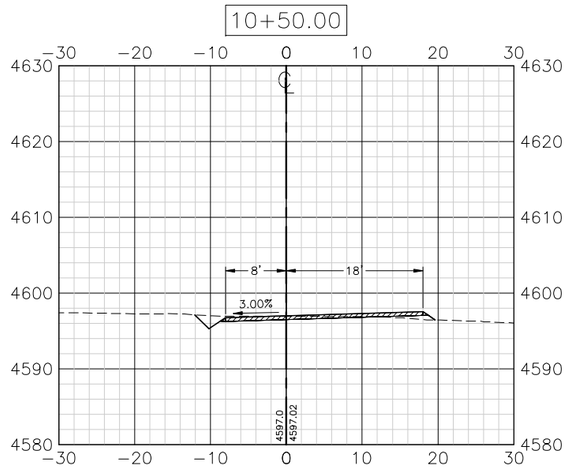
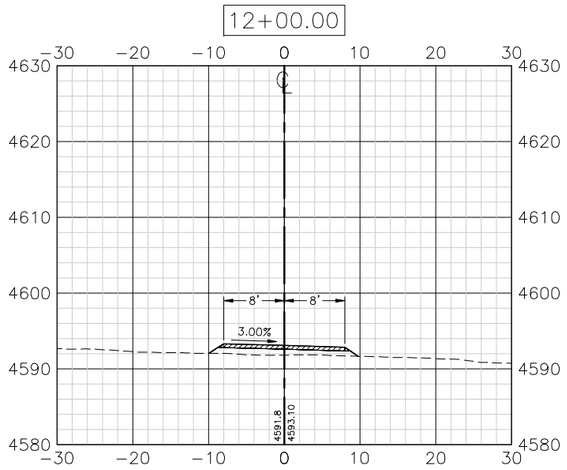
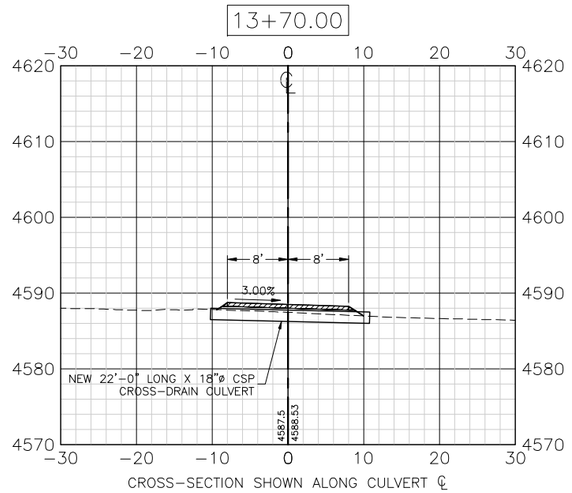
LOLO NATIONAL FOREST
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROADWAY CROSS-SECTIONS

SHEET NO.
16
OF 18

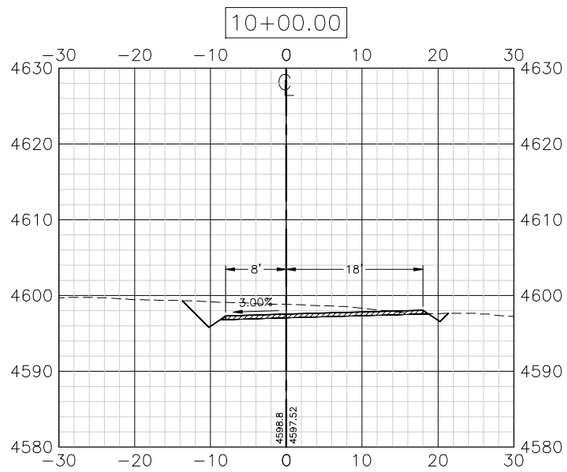
F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-14-Roadway XSC.dwg

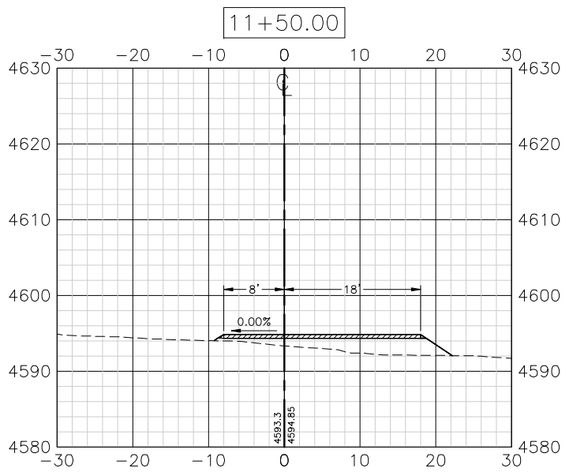


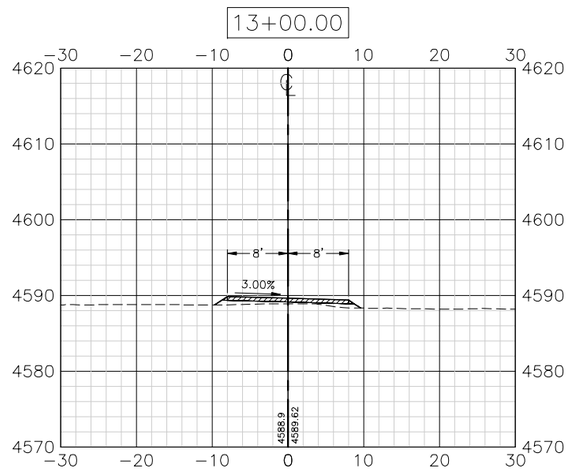


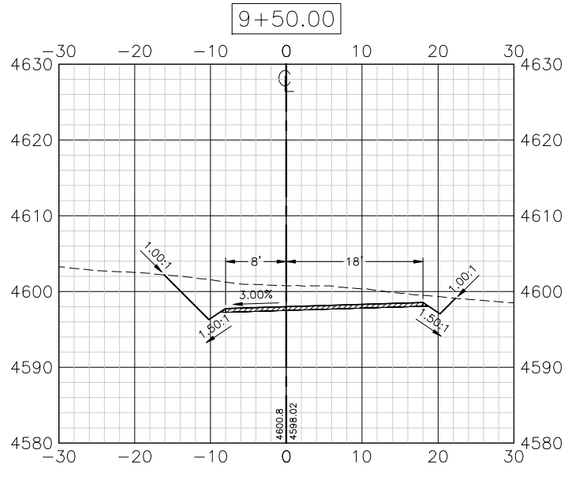


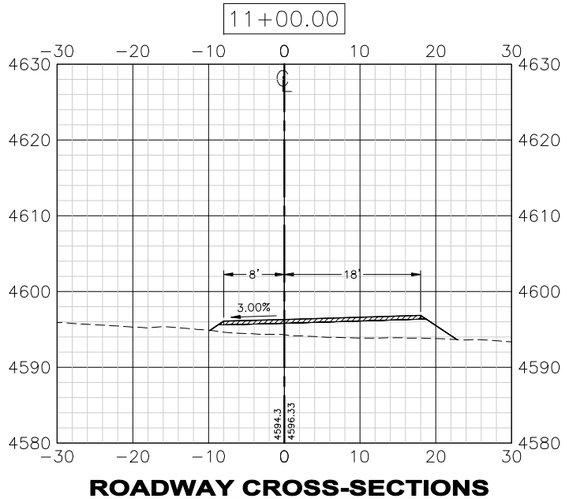
CROSS-SECTION SHOWN ALONG CULVERT ℄

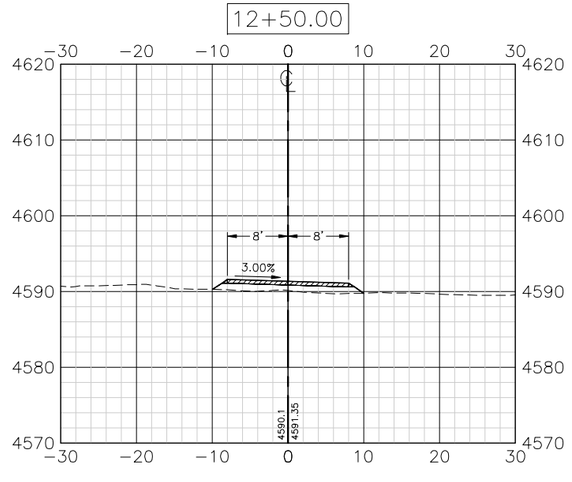












ROADWAY CROSS-SECTIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
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DATE: APRIL 26, 2018

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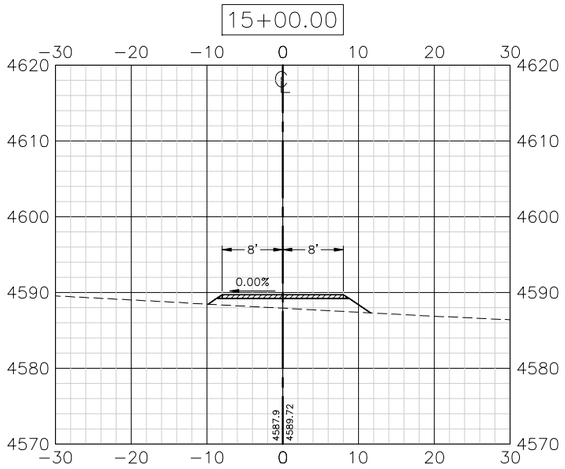
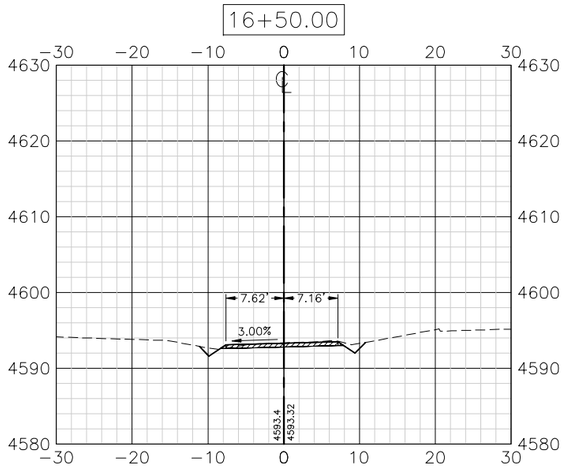
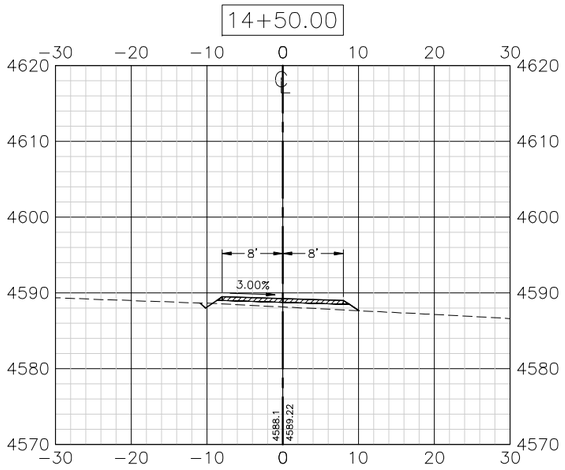
COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROADWAY CROSS-SECTIONS

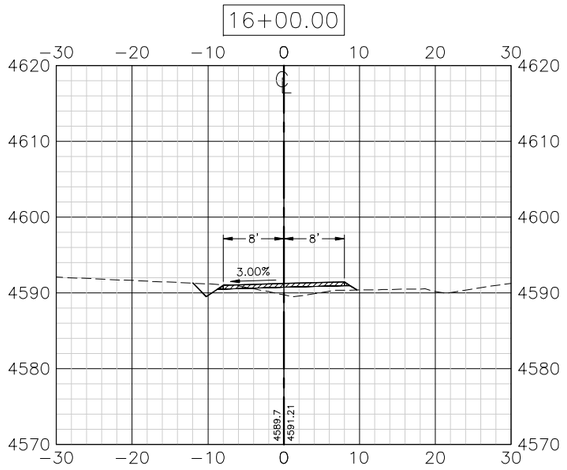
SHEET NO.
17
OF 18

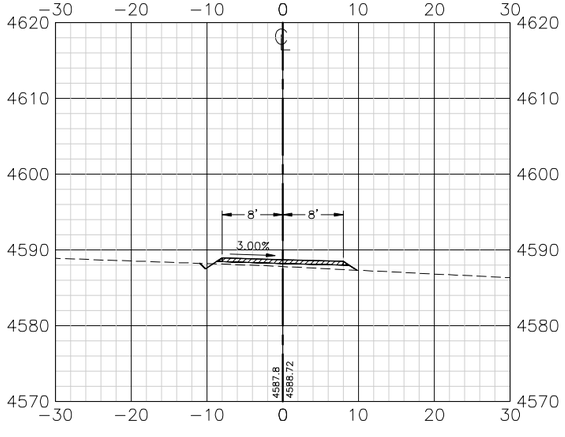
F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-15-Roadway XSC.dwg

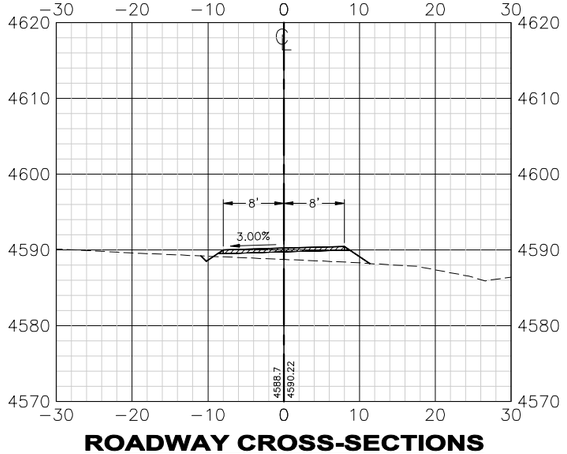


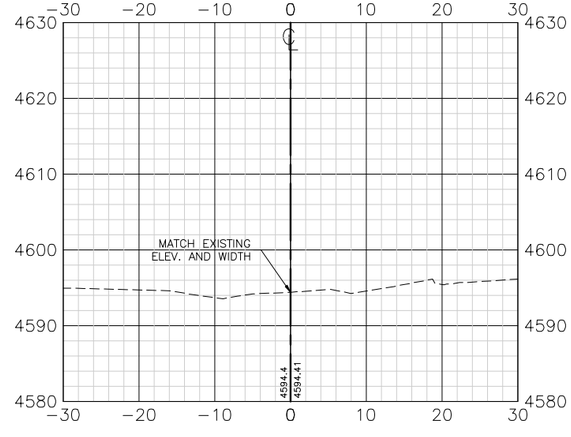












ROADWAY CROSS-SECTIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

SUPERELEVATION DATA

DESCRIPTION	*SUPERELEVATION*
STA. 0+70.00 TO STA. 3+00.00	3.00% - OUTSLOPED
STA. 3+00.00 TO STA. 4+00.00	TRANSITION TO 3.00% - INSLOPED
STA. 4+00.00 TO STA. 11+00.00	3.00% - INSLOPED
STA. 11+00.00 TO STA. 12+00.00	TRANSITION TO 3.00% - OUTSLOPED
STA. 12+00.00 TO STA. 14+50.00	3.00% - OUTSLOPED
STA. 14+50.00 TO STA. 15+50.00	TRANSITION TO 3.00% - INSLOPED
STA. 15+50.00 TO STA. 16+70.00	3.00% - INSLOPED

50% SUBMITTAL

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-17327
DESIGNED: JDE
DESIGN CHECKED: JJT
DRAWN: JDE
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COTTONWOOD CREEK TRIBUTARY CULVERT REPLACEMENT AND ROAD REALIGNMENT
ROAD NO. 477 - M.P. - 10.5
ROADWAY CROSS-SECTIONS

SHEET NO.
18
OF 18

F:\1-17327-Lolo NF-Rice Ridge BAER Culverts\CADD 1-17327-Cottonwood Cr Trib-477\Sheets\1-17327-16-Roadway XSC.dwg